CSA-1
2 MHz FFT Spectrum Analyzer

Guide to Operations

4/01

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BELAR ELECTRONICS LABORATORY, INC.
119 LANCASTER AVENUE • P.O. BOX 76 • DEVON, PA 19333-0076 USA
VOICE (610) 687-5550 • FAX (610) 687-2686
WEB: http//www.belar.com/ • E-mail: sales@belar.com • service@belar.com • parts@belar.com

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WARRANTY AND ASSISTANCE

All Belar products are warranted against defects in materials and workmanship. This warranty applies for one year from the date of delivery, FOB factory or, in the case of certain major components listed in the instruction manual, for the specified period. Belar will repair or replace products which prove to be defective during the warranty period provided that they are returned to Belar prepaid. No other warranty is expressed or implied. Belar is not liable for consequential damages.

For any assistance, contact your Belar Sales Representative or Customer Engineering Service at the Belar factory.

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Thank you for purchasing the CSA-1 FFT Spectrum Analyzer from Belar. Although the unit is simple to operate, it has so many features and capabilities that a few minutes spent with this Guide will enable you to get the most out of your purchase.

We also ask that you take a moment now to fill out and return the enclosed product registration form. It will allow us to keep you informed of future product developments at Belar.

PLEASE FILL OUT AND RETURN THE FORM TODAY!!!

(If you can't find the form, just send us a note with your name, company, address, and phone and FAX numbers.)

Future software updates will be available on our website at http://www.belar.com/ If you wish to be notified of these updates by e-mail, send us a message at support@belar.com.

1 General Information

1-1 General Description

The Belar CSA-1 is a versatile FFT Spectrum Analyzer which may be used for AM, FM and TV applications as well as just audio. Equipped with 2 MHz RF/IF, 150 kHz composite, 24 kHz L/R analog and 24 kHz L/R digital audio inputs, the CSA-1 can be used to view the real time spectrum of a wide variety of input signals. The CSA-1's 256 x 64 vacuum fluorescent display provides clear high contrast images with several vertical and horizontal axis controls, allowing for quick and easy adjustments to the unit's amplitude and frequency scales. An on-screen cursor function allows direct reading of any frequency and amplitude displayed at 0.1 dB resolution. All these features combined make the CSA-1 a compact, inexpensive and full featured FFT spectrum analyzer that will provide many useful measurements for the broadcaster, audio engineer, and recording engineer.

Just a few of the features:

Vertical Axis - Amplitude

- 120 dB dynamic range (Adjustable)
- Amplitude resolution to 0.1 dB
- Linear (percent) and dB scales
- Infinite peak hold, peak hold, average display modes or real time
- Display sum and/or difference of L/R analog or digital inputs

Horizontal Axis - Frequency

- Frequency resolution adjustable over a wide range
- Cursor display of frequency and amplitudes to 0.1 dB
- Offset frequency function allows narrowband spectrum analysis over the entire input bandwidth
- Split screen for simultaneous display of two channels

Misc.

- User selectable FFT window function
- Display storage and user defined spectral masks for checking compliance

1-2 Specifications

Inputs:

2 MHz analog RF/IF ..... 0.15 to 2.0 Vrms, 100kΩ, unbalanced, BNC
150 kHz analog composite ..... 0.35 to 3.5 Vrms, 100kΩ, unbalanced, BNC
24 kHz analog L and R inputs ..... 0.15 to 5.0 Vrms (-14 dBu to +16 dBu)
100kΩ, unbalanced, BNC
600Ω, balanced, XLR
AES/EBU (rate convertor 10-56 kHz) ..... XLR
S/PDIF (rate convertor 10-56 kHz) ..... RCA

Outputs:

RS-232 port. 9 pin D connector. With supplied Windows software allows remote display, printing and storage of spectrums.

Dimensions ..... 3.5" (2 EIA Rack Units) H x 14.25" D x 19" W

Power Requirements ..... 100-240 Vac, 50/60 Hz, 30 Watts

Shipping Weight ..... 12 lbs.

2 Unpacking

2-1 Initial Inspection

Check the shipping carton for external damage. If the carton exhibits evidence of abuse in handling (holes, broken corners, etc.) ask the carrier's agent to be present when the unit is unpacked. Carefully unpack the unit to avoid damaging the equipment through use of careless procedures. Inspect all equipment for physical damage immediately after unpacking. Bent or broken parts, dents and scratches should be noted. If damage is found, refer to Paragraph 2-2 for the recommended claim procedure. Keep all packing material for proof of claim or for possible future use.

The CSA-1 is shipped with a Guide to Operations, the CSA-1 software, 4 black rack-mount screws and a three-wire line cord.

2-2 Claims

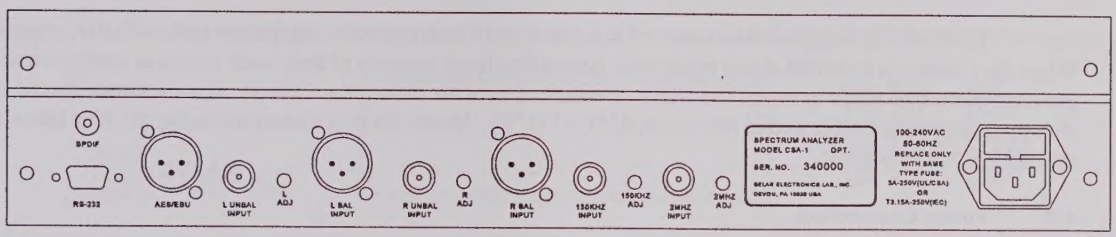
If the unit has been damaged, notify the carrier immediately. File a claim with the carrier or transportation company and advise Belar of such action to arrange the repair or replacement of the unit without waiting for a claim to be settled with the carrier.

2-3 Repacking for Shipment

If the unit is to be returned to Belar, attach a tag to it showing owner and owner's address. A description of the service required should be included on the tag. The original shipping carton and packaging materials should be used for reshipment. If they are not available or reusable, Belar can provide a replacement box and packaging at a nominal cost. Alternatively, the unit should be repackaged in the following manner:

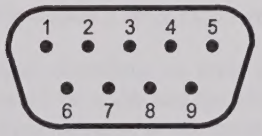
a) Use a double-walled carton with a minimum test strength of 275 pounds.
b) Use heavy paper or sheets of cardboard to protect all surfaces.
c) Use at least 4 inches of tightly packed, industry approved, shock absorbing material such as extra firm polyurethane foam or rubberized hair. **Newspaper is not sufficient for cushioning material!**
d) Use heavy duty shipping tape to secure the outside of the carton.
e) Use large **FRAGILE** labels on each surface.
f) Return the unit, freight prepaid, via air freight. Be sure to insure the unit for full value.

3 Rear Panel Connections



2MHZ INPUT	2 MHZ bandwidth analog RF/IF input. 0.15 to 2.0 Vrms, 100kΩ, unbalanced, BNC connector.
150KHZ INPUT	150 kHz bandwidth analog composite input. 100kΩ, unbalanced, BNC connector.
R BAL INPUT	24 kHz bandwidth analog right channel audio input. 0.15 to 5.0 Vrms (-14 dBu to +16 dBu), 600Ω, balanced, XLR connector.
R UNBAL INPUT	24 kHz bandwidth analog right channel audio input. 0.15 to 5.0 Vrms (-14 dBu to +16 dBu), 100kΩ, unbalanced, BNC connector.
L BAL INPUT	24 kHz bandwidth analog left channel audio input. 0.15 to 5.0 Vrms (-14 dBu to +16 dBu), 600Ω, balanced, XLR connector.
L UNBAL INPUT	24 kHz bandwidth analog left channel audio input. 0.15 to 5.0 Vrms (-14 dBu to +16 dBu), 100kΩ, unbalanced, BNC connector.
AES/EBU	AES/EBU input (rate convertor 10-56 kHz), XLR connector.
SPDIF	S/PDIF input (rate convertor 10-56 kHz), RCA connector.
RS-232	This male 9-pin D-type RS-232 connector is provided for direct communication between the CSA-1 and an IBM-compatible computer using the CSA-1 Windows software. If you intend to write software to directly communicate with the CSA-1 using this port, please refer to *Section 6* later in this manual.

Pin	Type		Description
1,4,6	common		pins tied together
2	output	Tx	CSA-1 transmit data
3	input	Rx	CSA-1 receive data
5	ground	GND	signal ground
7	input	CTS	clear to send
8	output	RTS	request to send



RS-232 Connector

4 Installation and Setup

4-1 General

The CSA-1 is designed to be mounted in a standard 19 inch electronic equipment rack with EIA standard spacing. When the monitor is mounted above equipment generating large amounts of heat, such as power supplies and amplifiers, provisions must be made to insure the free movement of cool air around the CSA-1. In no instance should the ambient chassis temperature be allowed to rise above 45°C (113°F). Mount the unit to the rack using the four black 10-32 rack-mounting screws provided.

4-2 Power Connection

The CSA-1 uses a switching power supply that accepts line voltages in the range of 100–240 Vac, 50–60 Hz. No adjustment is necessary as long as the line voltage falls within these ranges. The fuse in the rear panel AC input module should only be a type 3A–250 V (UL/CSA) fuse or a type T3.15A–250 V (IEC) fuse. A spare fuse is stored in the removable fuse compartment in the module.

The rear panel AC power entry module conforms to the IEC-320 standard and accepts a PH-386 grounded AC connector. The CSA-1 is supplied with a three-conductor power cord with a PH-386 female connector on one end and a type PH-290B male connector on the other end for standard 115 Vac operation. If 230 Vac operation is specified, the male connector is a type PH-44C. When the power cord is plugged into an appropriate AC outlet, the unit is grounded. (The offset pin on the power cable's three-prong connector is the ground contact.) To preserve the grounding feature when operating the unit from a two-contact outlet, use a three-prong-to-two-prong adaptor and connect the green pigtail on the adaptor to a good electrical ground.

The CSA-1 does not have an internal power switch. When the power cord is attached, the unit is operating.

4-3 Input Signal Connections

Connect the signals to be analyzed to the appropriate inputs on the CSA-1 rear panel. Refer to *section 3; Rear Panel Connections* for input level and impedance information.

Each of the four analog CSA-1 inputs has an input level adjust pot associated with it. After making sure that the input signal level falls within the specified level range, use this pot to set the desired reference level on the CSA-1 display.

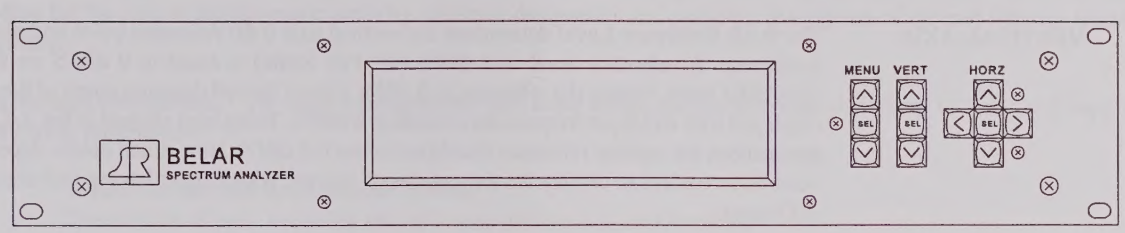
If the input level is below the specified range, you will be unable to set the reference level to the desired point and the accuracy of a signal-to-noise reading could be degraded. If the input level is above the specified range, spurious signals will be generated by overdriving the unit input. In extreme cases, CSA-1 circuit damage could result.

4-4 RS-232 Connection

This male 9-pin D type RS-232 connector is provided for direct communication between the CSA-1 and an IBM-compatible computer using the CSA-1 software.

This method of CSA-1 to computer communication may be accomplished with a direct connection (on-site) or from any distance via a telephone/modem connection.

5 Front Panel Operation



5-1 Menu Selections

To access the pop-up menu functions press any one of the menu buttons. Use the up/down arrow buttons to select a menu function and then press the center select button. To back out of a menu, double-click the center select button. The current menu functions are described below.

INPUT SELECT — Used to select which input signal is used to generate the spectrum display. There are 4 analog inputs and one digital input available. The analog and digital left/right audio inputs may be displayed as individual channels, or in the dual mode, simultaneously side by side. The audio inputs may also be summed L+R or difference L-R.

DISPLAY MODE — The display mode setting determines how a spectrum is calculated and displayed. In real-time mode the spectrum is displayed every 100 ms or as fast as possible. Peak hold mode continues to calculate spectrums at the real-time rate and store the highest values, but updates the display at the selected time interval. Average mode gathers spectrum information for the specified number of FFTs, and then averages and displays the results. Finally, infinite hold mode displays the highest value recorded at each spectral bin, until it is disabled or reset.

STORAGE — Allows up to 10 different spectrum curves to be stored and recalled. The stored curve may be displayed along with the current spectrum , using the display on/off command. The stored curve may also be subtracted from the current spectrum and the difference spectrum displayed, using the subtract on/off command. The stored curves are held in non-volatile memory and will be retained after the CSA-1 is powered down.

MASKS — Allows up to 10 different user defined spectral masks to be stored and recalled. The recalled mask may be displayed along with the current spectrum , using the display on/off command. The mask may also be subtracted from the current spectrum and the difference spectrum displayed, using the subtract on/off command. The masks are held in non-volatile memory and will be retained after the CSA-1 is powered down.

WINDOW TYPE — There are 6 different window types available, arranged according to their attenuation characteristics. There is always a trade-off between the main lobe width and the attenuation of a window function. To select a window type, consider the dynamic range of the input signal and how much spillage into adjacent FFT bins can be tolerated.

PRESETS — Up to 10 presets can be saved and recalled. The CSA-1 uses preset 0 as the power up default setting. To save or recall a preset, use the up/down arrow buttons to select the preset number and then press the select button.

DISPLAY OPTIONS — There are 3 display options. The curve fill option determines whether the spectrum curve is drawn as a line or a solid filled curve. The brightness option controls the luminance of the display

with level 1 = 100% down to level 4 = 60%. Finally, the screen saver helps to prevent burn-in of the display by changing it to a bouncing Belar logo after 30 minutes without a key being struck. Striking any key will wake the CSA-1 up.

VERTICAL AXIS — The 0 dB Reference Level determines the vertical axis 0 dB reference point and also the A/D headroom. A reference level 0.0 dBFS (dB Full Scale) is equal to 0 dBFS on the A/D or AES/EBU input. Setting the reference at 0 dBFS allows the full dynamic range of the A/D to be displayed with any input frequencies exceeding 0 dBFS, being hard clipped in the A/D. For most applications the vertical reference should set below 0.0 dBFS. How much below depends on the headroom required to display the frequencies of interest, without overdriving and clipping at the A/D input..

HORIZONTAL AXIS — The Frequency Scale selection allows spectrums to be displayed with an absolute, direct reading, or a +/- offset frequency axis. The +/- offset frequency scale is referenced to the Center Frequency selected. For viewing AM or FM IF carriers the Center Frequency should be set to the appropriate carrier frequency.

5-2 Vertical Scale

Using the VERT select button, highlight the vertical scale function you wish to choose. The selected function may then be adjusted using the vertical up/down arrow buttons The three functions are explained below.

dB — This function scrolls the dB scale in major divisions, determined by the vertical resolution, from +100.0 dB to -120 dB.

VR x.x dB — This function adjusts the vertical dB scale from a full scale span of 120 dB in 2.5 dB steps, to a 4.8 dB span in 0.1 dB steps. There are 7 possible dB scales and the vertical axis resolution is 48 points.

C1 -xxx.x dB — The C1 cursor draws a horizontal dotted line across the spectrum display at a particular dB level. The reference line may be moved up and down the vertical scale and positioned at any minor dB division. To zoom in and out around a particular dB level , set the C1 cursor to the desired level and change the VR setting to vary the dB resolution around the selected level.

5-3 Horizontal Scale

The horizontal scale controls consist of left/right and up/down arrow buttons, and a select button. The left/right buttons shift the frequency axis, where applicable, left or right across the frequency range of the input. The horizontal select button toggles between two functions, the active one being highlighted. These functions are explained below.

HR: xxx Hz — The horizontal resolution is the FFT bin size or frequency resolution. The spectrum display is made up of 200 points equally spaced at this horizontal resolution. To display a specific part of the spectrum use the left/right buttons to shift the frequency axis to the desired location, or more easily, first position the horizontal cursor on a particular frequency. The display is automatically scaled around the cursor position, keeping that frequency in the center of the display.

C2: xxx.xxx kHz — Using the C2 cursor function, data at the displayed frequency can be read to 0.1 dB. The cursor position also determines the zoom in/out point when the horizontal frequency resolution is changed. The dB amplitude value displayed is scaled using the 0 dB Reference Level value. A positive dB amplitude , while being clipped on the display, indicates a magnitude greater then the 0 dB Reference Level. As an example, if the 0 dB Reference Level is -3.0 dBFS, and the amplitude at the selected frequency is -0.5 dBFS, the cursor will display a +2.5 dB reading.

6 Diagrams, Schematics and Parts Lists

Replaceable Parts. This page contains information for ordering replaceable parts for the CSA-1. The tables that follow list the parts in alphanumeric order by reference designation and provide a description of the part with the Belar part number.

Ordering Information. To order a replacement part from Belar, address the order or inquiry to Belar and supply the following information:

a. Model number and serial number of unit.
b. Description of part, *including the reference designation and location.*

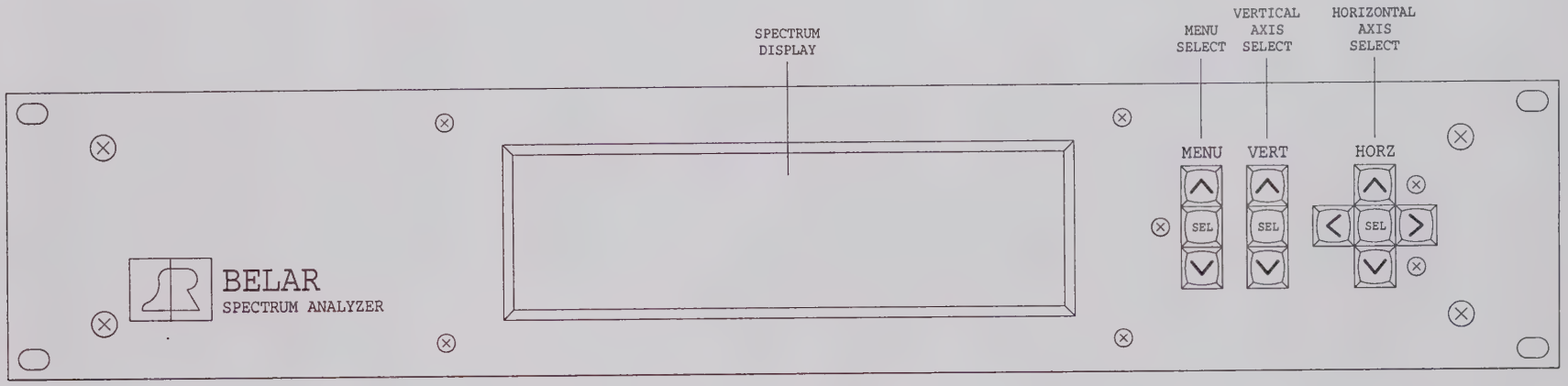
Orders may also be taken over the telephone. Parts orders can be put on your VISA, MasterCard, or American Express card, or we can ship them COD.

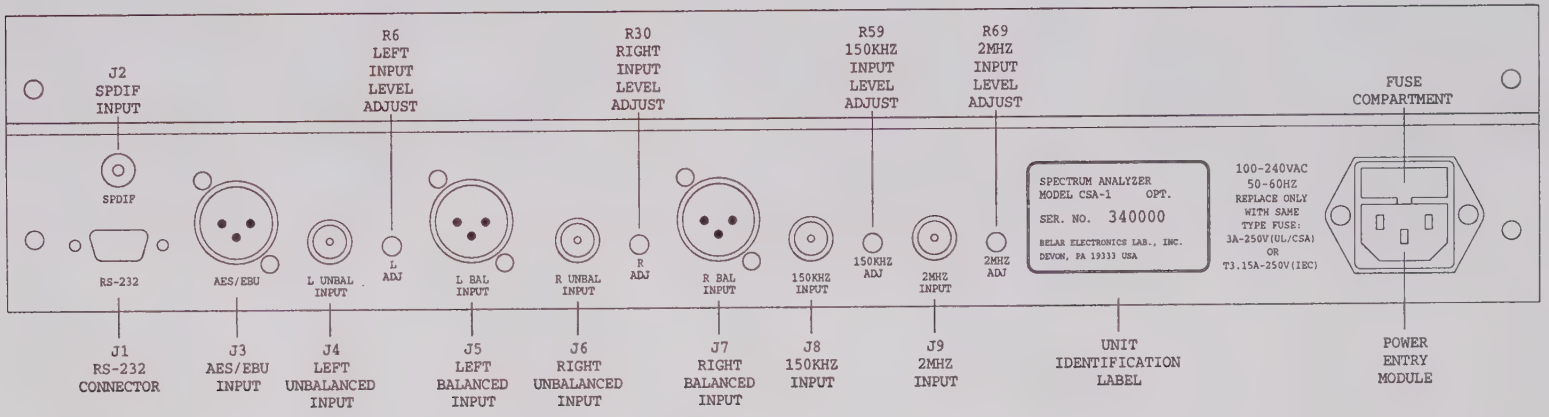
REFERENCE DESIGNATORS

A	= assembly	J	= jack	S	= switch
BR	= diode bridge	L	= inductor	T	= transformer
C	= capacitor	M	= meter	TB	= terminal block
CR	= diode or LED	P	= plug	U	= integrated circuit
DS	= display or lamp	Q	= transistor	W	= cable
F	= fuse	R	= resistor	X	= socket
FL	= filter	RL	= relay	Y	= crystal
HDR	= header connector	RN	= resistor network		

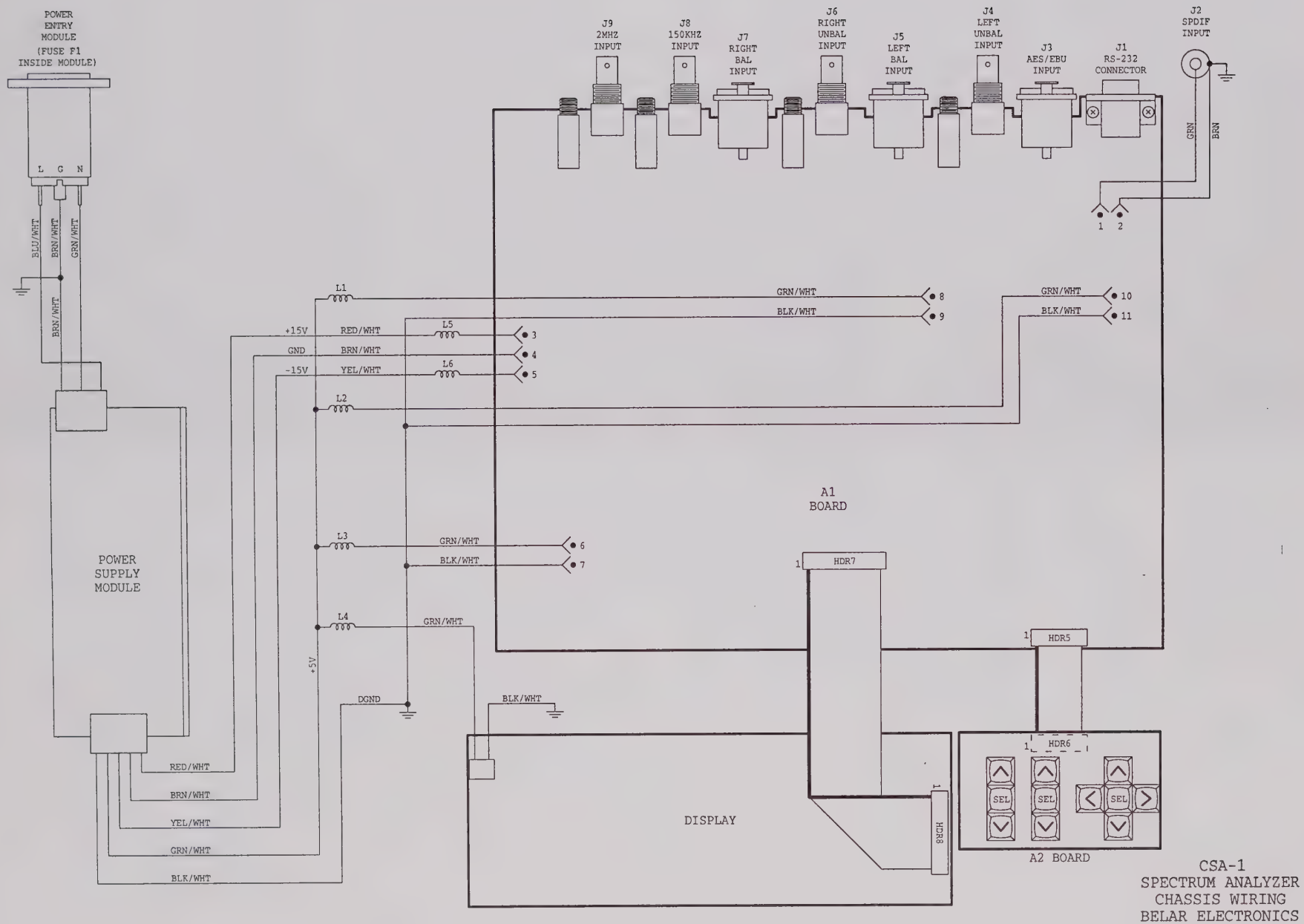
ABBREVIATIONS

ADC	= analog-to-digital converter	PIV	= peak inverse voltage
BCD	= binary coded decimal	POLY	= polystyrene
CER	= ceramic	PORC	= porcelain
COMP	= composition	POT	= potentiometer
CONN	= connector	SEMICON	= semiconductor
DAC	= digital-to-analog converter	SI	= silicon
DPM	= digital panel meter	TANT	= tantalum
ELEC	= electrolytic	μF	= microfarads
GE	= germanium	V	= volt
IC	= integrated circuit	VAR	= variable
k	= kilo = 1,000	VDCW	= dc working volts
M	= meg = 1,000,000	W	= watts
MOD	= modulation	WW	= wirewound
MY	= Mylar		
PC	= printed circuit		
pF	= picofarads		





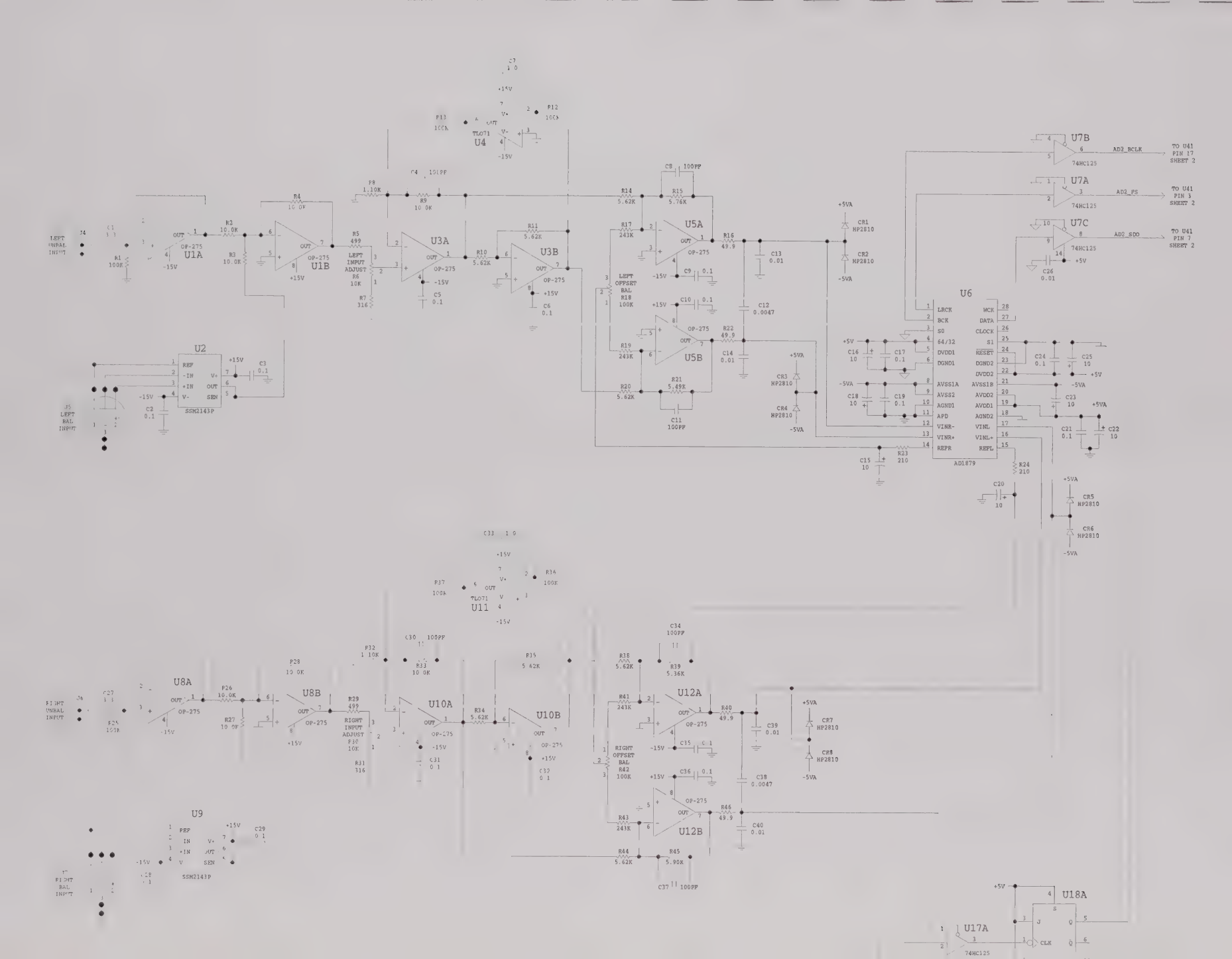
CSA-1 FRONT & REAR VIEW
BELAR ELECTRONICS

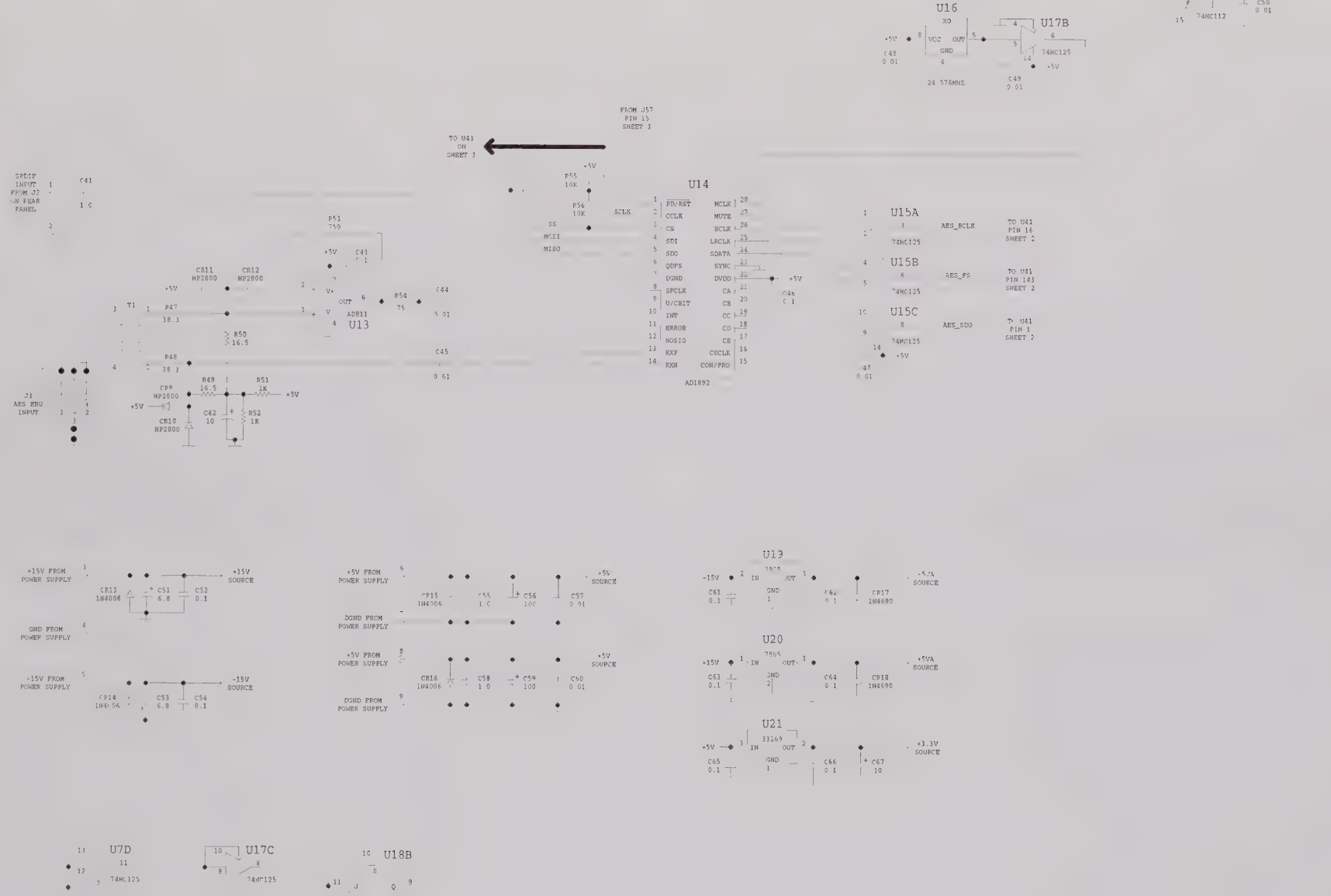


CSA-1
SPECTRUM ANALYZER
CHASSIS WIRING
BELAR ELECTRONICS
8-2-00

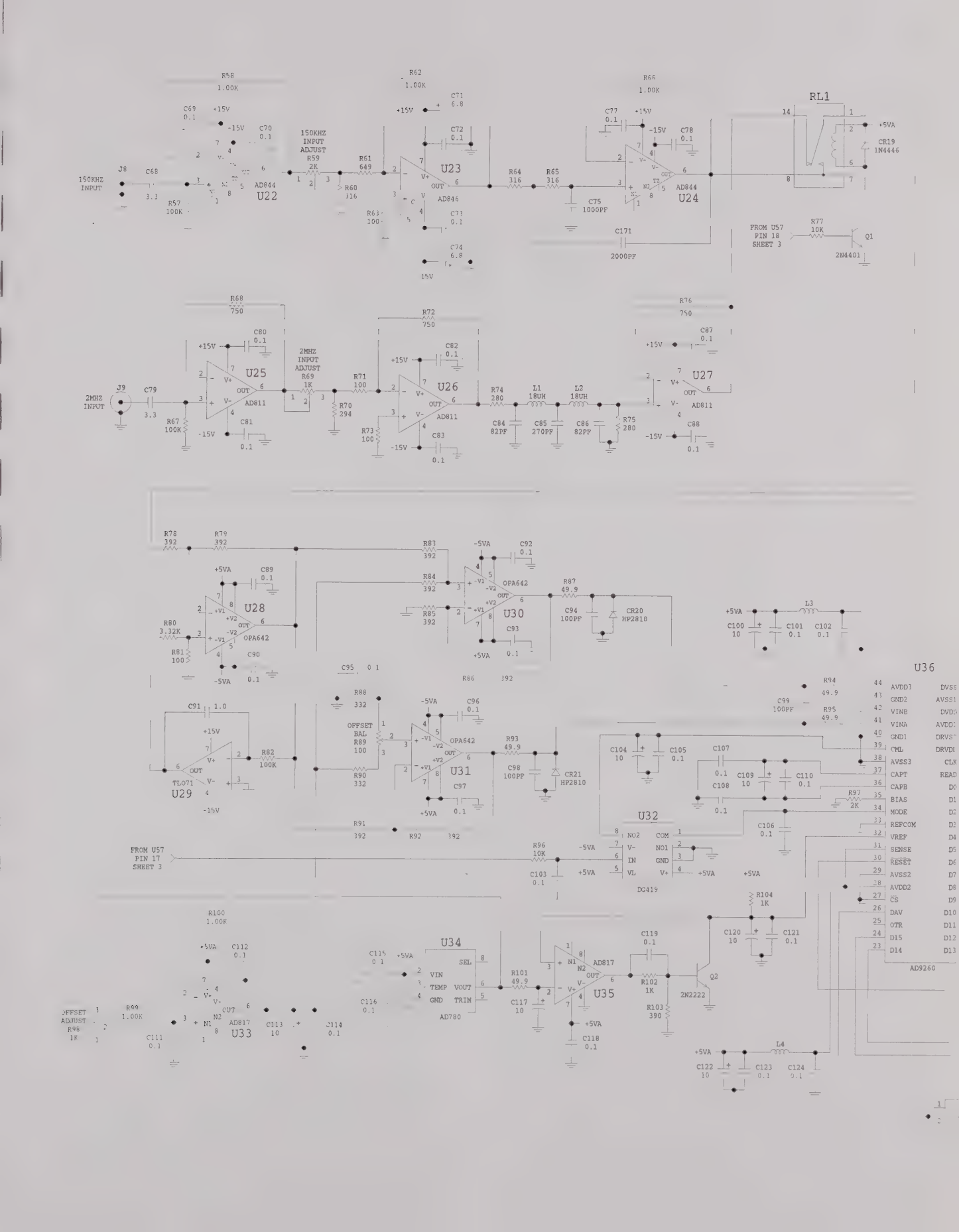
MAIN CHASSIS

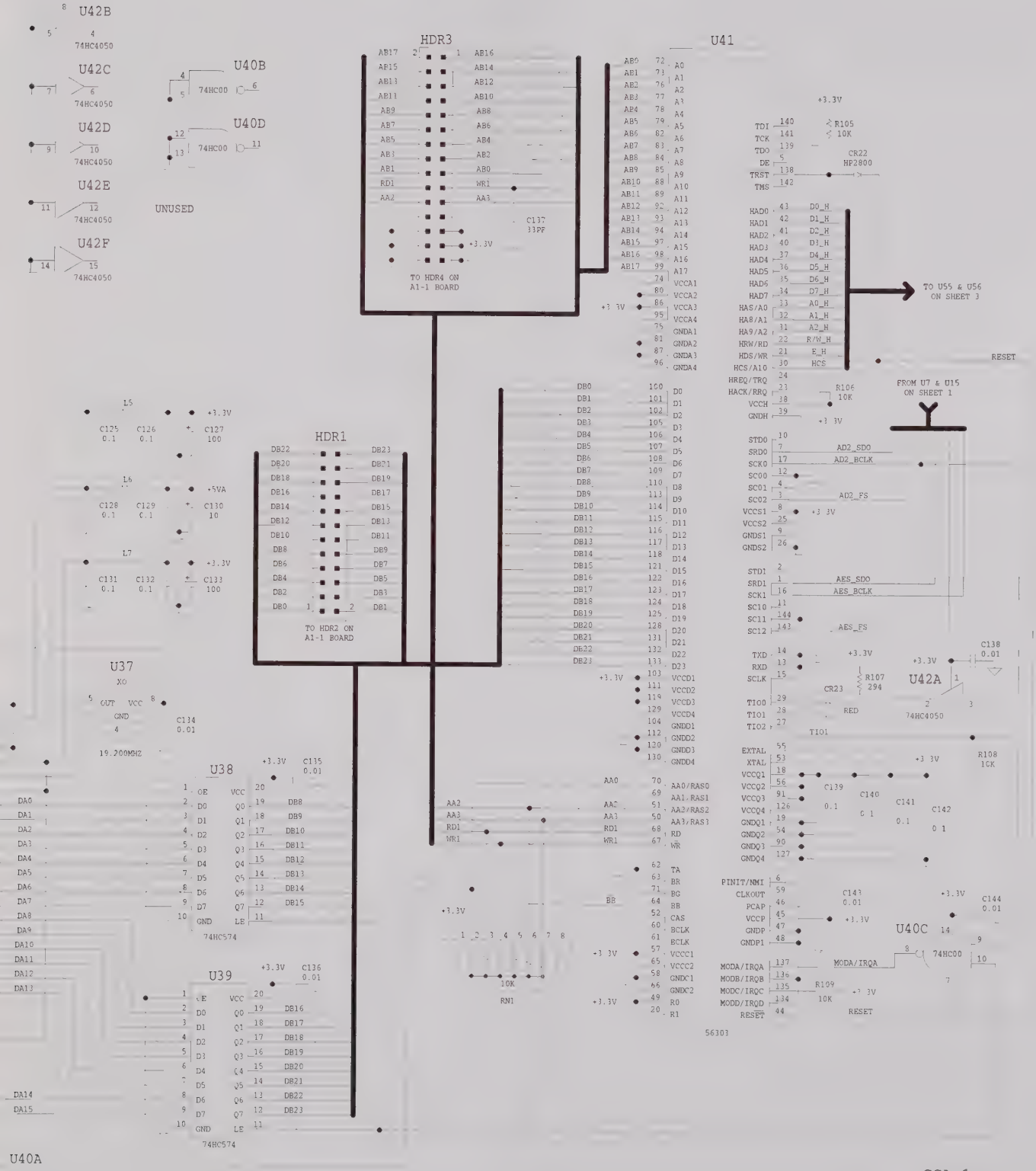
Reference Designation	Description	Part Number
A3	POWER SUPPLY MODULE: 30W	4005-0020A
A4	DISPLAY: VACUUM FLUORESCENT	1930-0030
--	POWER ENTRY MODULE: 6EGG1-1	0360-0021
F1	FUSE: GMA-3A 250V(UL/CSA) or T3.15A-250V(IEC)	2110-0009
J2	JACK: PHONO 3501FP	0360-0007
L1 thru L6	CHOKE: RF	9140-0011
--	FLAT CABLE ASSEMBLY: 16 CONDUCTOR	8900-0024
--	FLAT CABLE ASSEMBLY: 26 CONDUCTOR	8900-0025
--	LINE CORD (115 Vac line voltage)	8120-0002
--	LINE CORD (230 Vac line voltage)	8120-0004

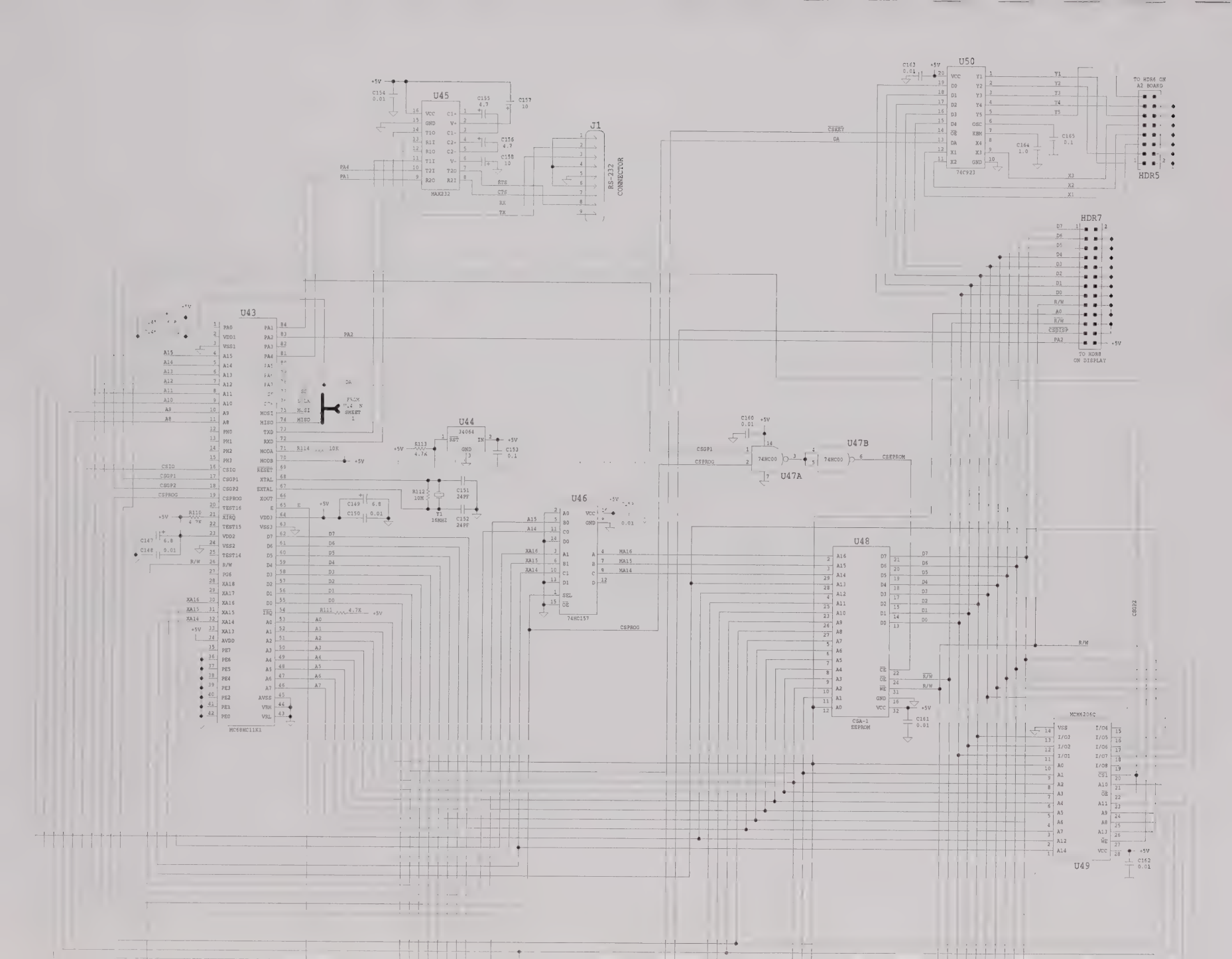

U1A
U1B
U2
SSM2143P
U3A
U3B
U4
TL071
U5A
U5B
U6
AD1879
LRCK
BCK
SDATA
LOUT
ROUT
U7A
U7B
U7C
74HC125
AD2_BCLK
AD2_FS
AD2_SDO
TO U41 PIN 17 SHEET 2
TO U41 PIN 3 SHEET 2
TO U41 PIN 7 SHEET 2
LEFT UNBAL INPUT
LEFT BAL INPUT
LEFT INPUT ADJUST R6 10K
LEFT OFFSET BAL R18 100K
U8A
U8B
U9
U10A
U10B
U11
U12A
U12B
RIGHT UNBAL INPUT
RIGHT BAL INPUT
RIGHT INPUT ADJUST R30 10K
RIGHT OFFSET BAL R42 100K
U17A
U18A
74HC125
CLK
+15V
-15V
+5V
-5V
+5VA
-5VA

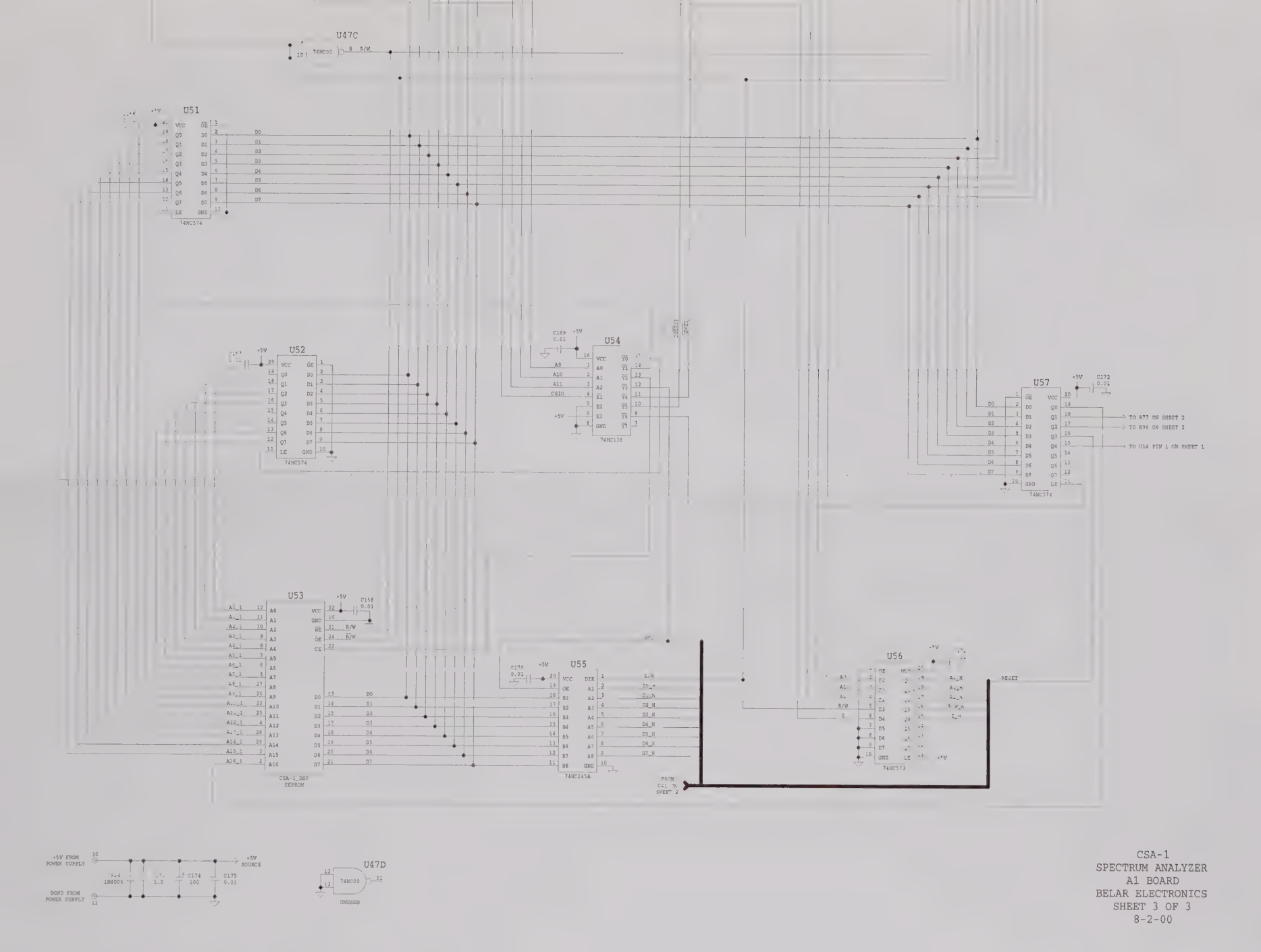


CSA-1
SPECTRUM ANALYZER
A1 BOARD
BELAR ELECTRONICS
SHEET 1 OF 3
8-2-00


150KHZ INPUT
J8
C68
3.3
R57 100K
C69 0.1
C70 0.1
AD844
U22
150KHZ INPUT ADJUST
R59 2K
R60 316
R61 649
R58 1.00K
R62 1.00K
C71 6.8
C72 0.1
U23
AD846
C73 0.1
C74 6.8
R64 316
R65 316
C75 1000PF
C171 2000PF
R66 1.00K
C77 0.1
C78 0.1
U24
AD844
RL1
CR19 1N4446
+5VA
FROM U57 PIN 18 SHEET 3
R77 10K
Q1
2N4401
2MHZ INPUT
J9
C79
3.3
R67 100K
C80 0.1
U25
AD811
C81 0.1
2MHZ INPUT ADJUST
R69 1K
R70 294
R71 100
R68 750
R72 750
C82 0.1
U26
AD811
C83 0.1
R73 100
R74 280
L1 18UH
L2 18UH
C84 82PF
C85 270PF
C86 82PF
R75 280
R76 750
C87 0.1
U27
AD811
C88 0.1
R78 392
R79 392
C89 0.1
U28
OPA642
R80 3.32K
R81 100
C90 0.1
R83 392
R84 392
R85 392
C92 0.1
U30
OPA642
C93 0.1
R87 49.9
C94 100PF
CR20 HP2810
L3
C100 10
C101 0.1
C102 0.1
C91 1.0
U29
TL071
R82 100K
R88 332
OFFSET BAL R89 100
R90 332
C96 0.1
U31
OPA642
C97 0.1
R93 49.9
C98 100PF
CR21 HP2810
R91 392
R92 392
U36
AD9260
C99 100PF
R94 49.9
R95 49.9
C104 10
C105 0.1
C107 0.1
C108 0.1
C109 10
C110 0.1
R97 2K
C106 0.1
U32
DG419
FROM U57 PIN 17 SHEET 3
R96 10K
C103 0.1
R104 1K
C120 10
C121 0.1
R100 1.00K
C112 0.1
U33
AD817
C111 0.1
C113 10
C114 0.1
OFFSET ADJUST R98 1K
R99 1.00K
U34
AD780
C115 0.1
C116 0.1
R101 49.9
C117 10
U35
AD817
C119 0.1
R102 1K
Q2
2N2222
R103 390
C118 0.1
L4
C122 10
C123 0.1
C124 0.1

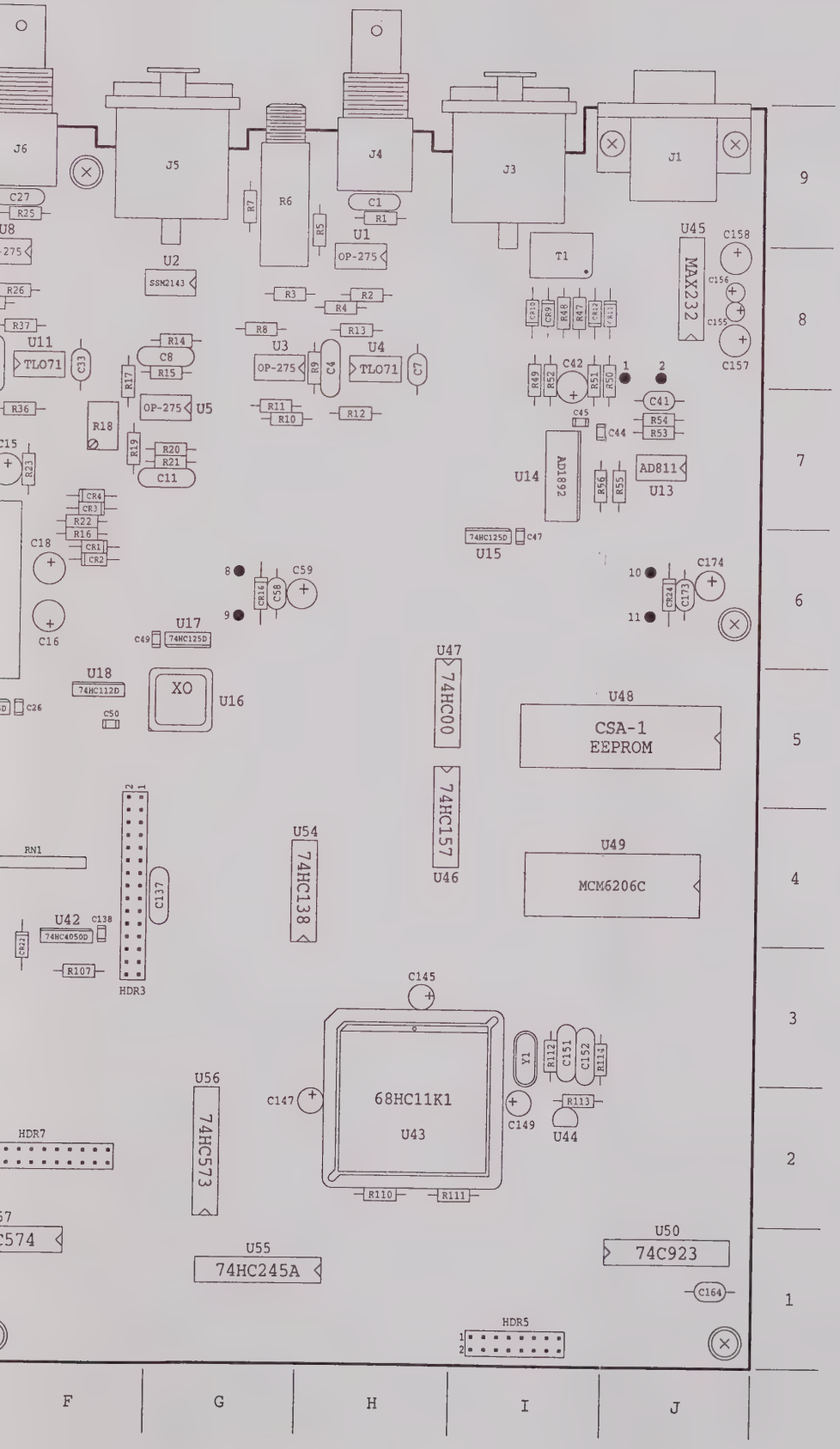

U42B
74HC4050
U42C
74HC4050
U42D
74HC4050
U42E
74HC4050
U42F
74HC4050
U40B
74HC00
U40D
74HC00
UNUSED
HDR3
TO HDR4 ON A1-1 BOARD
C137 33PF
U41
TO U55 & U56 ON SHEET 3
FROM U7 & U15 ON SHEET 1
RESET
HDR1
TO HDR2 ON A1-1 BOARD
U37
19.200MHZ
U38
74HC574
U39
74HC574
U40A
U42A
74HC4050
U40C
74HC00
RN1
10K
CSA-1
SPECTRUM ANALYZER
A1 BOARD
BELAR ELECTRONICS
SHEET 2 OF 3
8-2-00


U45
MAX232
C154 0.01
C155 4.7
C156 4.7
C157 10
C158 10
J1
RS-232 CONNECTOR
PA4
PA1
RTS
CTS
RX
TX
U50
74C923
C163 0.01
C164 1.0
C165 0.1
CSKEY
DA
TO HDR6 ON A2 BOARD
HDR5
HDR7
TO HDR8 ON DISPLAY
U43
MC68HC11K1
PA2
DA
SCK
MOSI
MISO
SHEET 1
U44
34064
R113 4.7K
C153 0.1
R114 10K
R112 10M
Y1 16MHZ
C151 24PF
C152 24PF
C149 6.8
C150 0.01
R110 4.7K
C147 6.8
C148 0.01
R111 4.7K
U46
74HC157
CSPROG
U47A
74HC00
U47B
74HC00
C160 0.01
CSGP1
CSPROG
CSEPROM
U48
CSA-1 EEPROM
C161 0.01
R/W
CSEPROM
U49
MCM6206C
C162 0.01

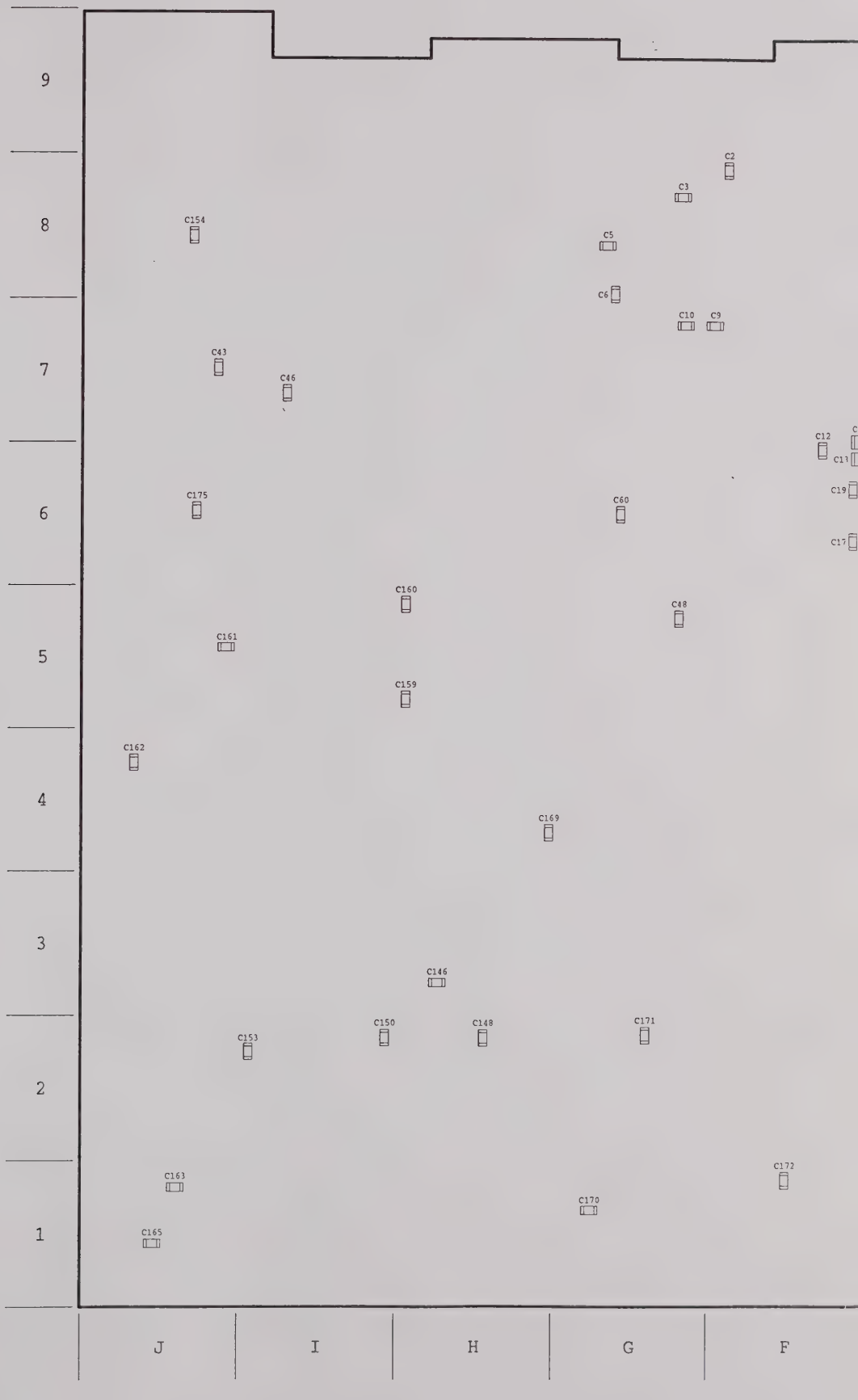


CSA-1
SPECTRUM ANALYZER
A1 BOARD
BELAR ELECTRONICS
SHEET 3 OF 3
8-2-00

J9
J8
J7
R69
R59
R30
U25
AD811
U22
AD844
U9
SSM2143
U26
AD811
U27
AD811
U23
AD846
U24
AD844
U12
OP-275
U10
OP-275
U28
OPA642
U29
LOTL
RL1
DIP RELAY
Q1
U34
AD780
U30
OPA642
U31
OPA642
U33
AD817
U35
AD817
Q2
U32
DG419
U36
AD9260
U37
XO
U38
74HC574D
U39
74HC574D
U40
74HC00D
U41
56303
HDR1
U19
U20
U21
U51
74HC574
U52
74HC574
U53
CSA-1_DSP
EEPROM
A
B
C
D
E



CSA-1 A1 BOARD
COMPONENT LAYOUT
BELAR ELECTRONICS


9
8
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J
I
H
G
F
C2
C3
C154
C5
C6
C10
C9
C43
C46
C12
C13
C19
C17
C175
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C160
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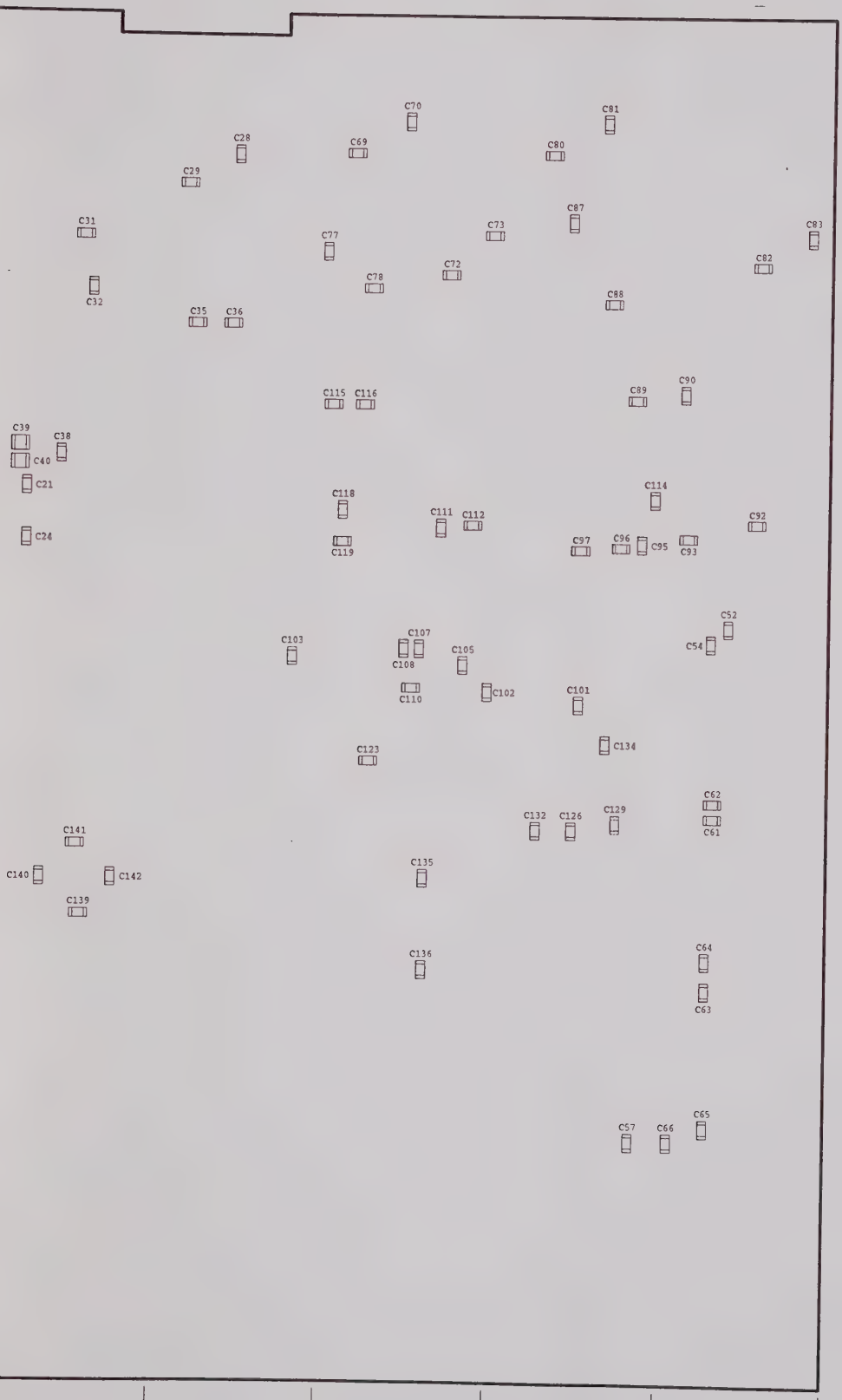
C170
C165



E D C B A

CSA-1 A1 BOARD
COMPONENT LAYOUT-BOTTOM
BELAR ELECTRONICS

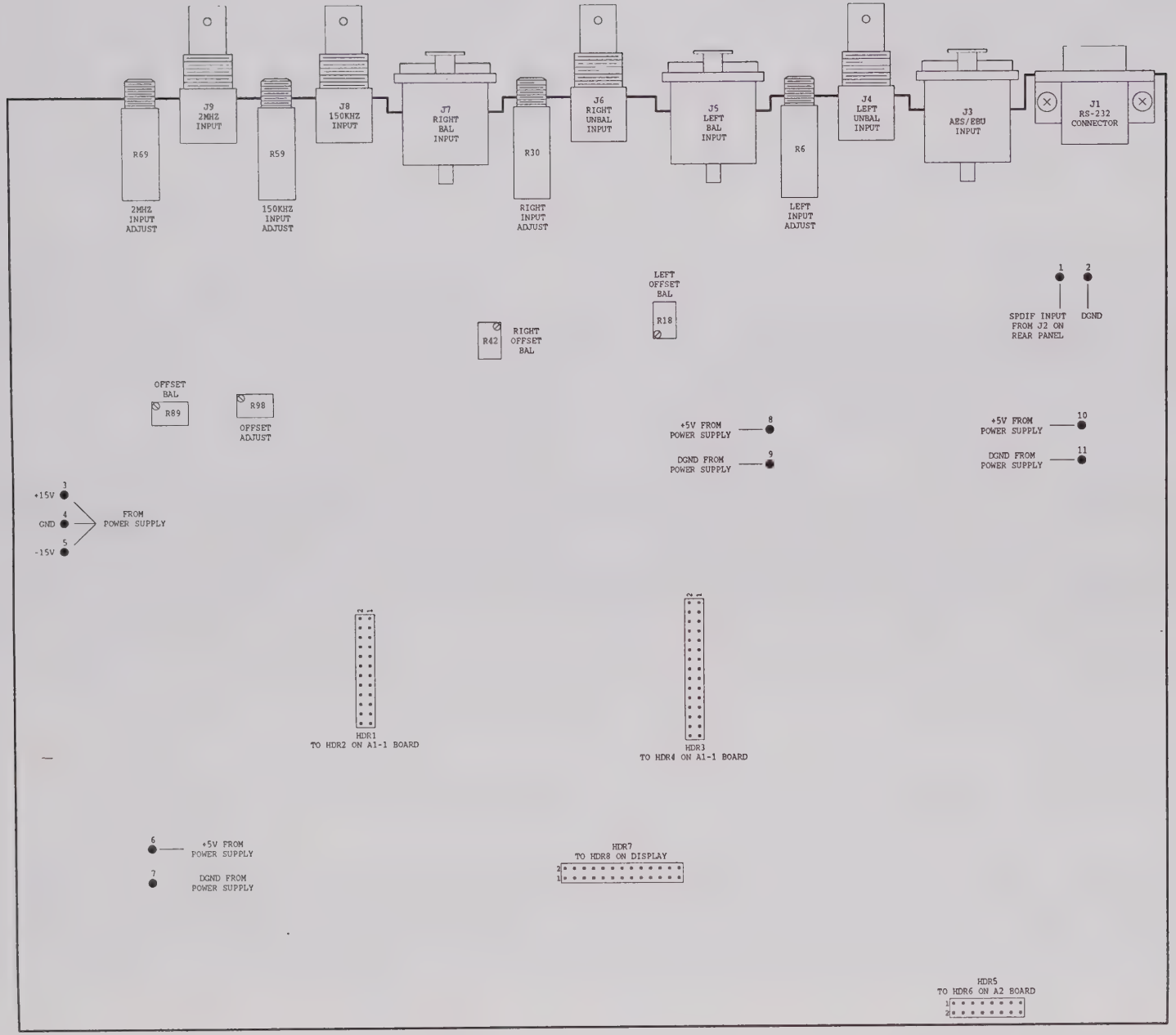
CSA-1 A1 BOARD
PART LOCATIONS

Desig/Loc		Desig/Loc		Desig/Loc		Desig/Loc		Desig/Loc		Desig/Loc	
C1	H9	C40	E6*	C79	B9	C118	C6*	C157	J8	CR20	B5
C2	F8*	C41	J7	C80	B8*	C119	C6*	C158	J8	CR21	C5
C3	G8*	C42	I8	C81	B9*	C120	C5	C159	H5*	CR22	F3
C4	H8	C43	J7*	C82	A8*	C121	C5	C160	H5*	CR23	E3
C5	G8*	C44	I7	C83	A8*	C122	C5	C161	J5*	CR24	J6
C6	G8*	C45	I7	C84	A8	C123	C4*	C162	J4*		
C7	H8	C46	I7*	C85	A8	C124	C4	C163	J1*	HDR1	D4
C8	G8	C47	I6	C86	B8	C125	B5*	C164	J1	HDR3	F4
C9	F7*	C48	G5*	C87	B8*	C126	B4*	C165	J1*	HDR5	I1
C10	G7*	C49	G6	C88	B7*	C127	B4	C166	C2	HDR7	F2
C11	G7	C50	F5	C89	B7*	C128	B5	C167	C2		
C12	F6*	C51	A5	C90	A7*	C129	B4*	C168	D2	J1	J9
C13	F6*	C52	A5*	C91	A7	C130	B4	C169	H4*	J3	I9
C14	F7*	C53	A5	C92	A6*	C131	B4	C170	G1*	J4	H9
C15	F7	C54	A5*	C93	A6*	C132	B4*	C171	G2*	J5	G9
C16	F6	C55	B2	C94	B5	C133	B4	C172	F1*	J6	F9
C17	F6*	C56	B2	C95	B6*	C134	B5*	C173	J6	J7	D9
C18	F6	C57	B2*	C96	B6*	C135	C4*	C174	J6	J8	C9
C19	F6*	C58	G6	C97	B6*	C136	C3*	C175	J6*	J9	B9
C20	E7	C59	G6	C98	C5	C137	G4				
C21	E6*	C60	G6*	C99	B5	C138	F4	CR1	F6	L1	A7
C22	E6	C61	A4*	C100	B5	C139	E3*	CR2	F6	L2	B7
C23	E6	C62	A4*	C101	B5*	C140	E4*	CR3	F7	L3	B5
C24	E6*	C63	A3*	C102	C5*	C141	E4*	CR4	F7	L4	C4
C25	E6	C64	A3*	C103	D5*	C142	E4*	CR5	E6	L5	B4
C26	F5	C65	A2*	C104	C5	C143	E4	CR6	E6	L6	B4
C27	F9	C66	A2*	C105	C5*	C144	D3	CR7	E7	L7	B4
C28	D8*	C67	A2	C106	C5	C145	H3	CR8	E7		
C29	D8*	C68	C9	C107	C5*	C146	H3*	CR9	I8	Q1	C7
C30	E8	C69	C8*	C108	C5*	C147	H2	CR10	I8	Q2	C6
C31	E8*	C70	C9*	C109	C5	C148	H2*	CR11	I8		
C32	E8*	C71	C7	C110	C5*	C149	I2	CR12	I8	R1	H9
C33	F8	C72	C8*	C111	C6*	C150	I2*	CR13	A5	R2	H8
C34	D7	C73	C8*	C112	C6*	C151	I3	CR14	A5	R3	G8
C35	D7*	C74	C8	C113	B6	C152	I3	CR15	B2	R4	H8
C36	D7*	C75	C8	C114	B6*	C153	I2*	CR16	G6	R5	H9
C37	D8	C76	C7	C115	C7*	C154	J8*	CR17	A5	R6	G9
C38	E6*	C77	C8*	C116	C7*	C155	J8	CR18	A4	R7	G9
C39	E7*	C78	C8*	C117	C6	C156	J8	CR19	B7	R8	G8

*note: these locations are on bottom of pc board.

CSA-1 A1 BOARD
PART LOCATIONS
cont.

Desig/Loc	Desig/Loc	Desig/Loc	Desig/Loc	Desig/Loc
R9 H8	R49 I8	R89 B6	U8 E8	U48 J5
R10 G7	R50 I8	R90 B6	U9 D8	U49 J4
R11 G7	R51 I8	R91 B6	U10 E8	U50 J1
R12 H7	R52 I8	R92 B6	U11 F8	U51 C2
R13 H8	R53 J7	R93 B6	U12 D7	U52 C2
R14 G8	R54 J7	R94 B5	U13 J7	U53 D2
R15 G8	R55 J7	R95 B5	U14 I7	U54 H4
R16 F6	R56 I7	R96 D5	U15 I6	U55 G1
R17 F8	R57 C9	R97 C5	U16 G5	U56 G2
R18 F7	R58 C8	R98 C6	U17 G6	U57 F1
R19 F7	R59 C9	R99 C6	U18 F5	
R20 G7	R60 C9	R100 B6	U19 A4	Y1 I3
R21 G7	R61 C8	R101 C7	U20 A3	
R22 F7	R62 C8	R102 C6	U21 A2	pins
R23 F7	R63 C8	R103 C6	U22 C8	1 J8
R24 E7	R64 C7	R104 C6	U23 C8	2 J8
R25 F9	R65 C8	R105 D3	U24 C8	3 A6
R26 F8	R66 C8	R106 E3	U25 B8	4 A5
R27 E8	R67 B9	R107 F3	U26 A8	5 A5
R28 E8	R68 B8	R108 E3	U27 B8	6 B2
R29 E9	R69 B9	R109 D4	U28 B7	7 B2
R30 E9	R70 A9	R110 H2	U29 A7	8 G6
R31 E9	R71 A8	R111 I2	U30 A6	9 G6
R32 E8	R72 A8	R112 I3	U31 B6	10 J6
R33 E8	R73 A8	R113 I2	U32 D5	11 J6
R34 E7	R74 A7	R114 I3	U33 C6	
R35 E7	R75 B8		U34 C7	
R36 F7	R76 B8	RL1 B7	U35 C6	
R37 F8	R77 C7		U36 C5	
R38 D7	R78 B7	RN1 F4	U37 B5	
R39 D7	R79 B7		U38 C4	
R40 E7	R80 A7	T1 I8	U39 C3	
R41 D7	R81 B7		U40 D3	
R42 E7	R82 A7	U1 H8	U41 E4	
R43 E7	R83 A6	U2 G8	U42 F4	
R44 E8	R84 A6	U3 G8	U43 H2	
R45 D8	R85 A6	U4 H8	U44 I2	
R46 E6	R86 A6	U5 G7	U45 J8	
R47 I8	R87 B5	U6 E6	U46 H4	
R48 I8	R88 B6	U7 E5	U47 H5	



CSA-1 A1 BOARD
CONNECTIONS &
ADJUSTMENTS
BELAR ELECTRONICS

A1 BOARD CSA-1

Reference Designation	Description	Part Number
C1	C: FIXED CERAMIC 3.3uF 50V	0151-0011
C2,C3	C: FIXED CERAMIC CHIP 0.1uF 50V C1206	0151-0014
C4	C: FIXED MICA 100pF 5%	0140-1015
C5,C6	C: FIXED CERAMIC CHIP 0.1uF 50V C1206	0151-0014
C7	C: FIXED CERAMIC 1.0uF 50V	0151-0008
C8	C: FIXED MICA 100pF 5%	0140-1015
C9,C10	C: FIXED CERAMIC CHIP 0.1uF 50V C1206	0151-0014
C11	C: FIXED MICA 100pF 5%	0140-1015
C12	C: FIXED CERAMIC CHIP 0.0047uF 50V C1206	0151-0030
C13,C14	C: FIXED CERAMIC CHIP 0.01uF 50V C1210	0151-0031
C15,C16	C: FIXED TANT 10uF 16V	0185-0007
C17	C: FIXED CERAMIC CHIP 0.1uF 50V C1206	0151-0014
C18	C: FIXED TANT 10uF 16V	0185-0007
C19	C: FIXED CERAMIC CHIP 0.1uF 50V C1206	0151-0014
C20	C: FIXED TANT 10uF 16V	0185-0007
C21	C: FIXED CERAMIC CHIP 0.1uF 50V C1206	0151-0014
C22,C23	C: FIXED TANT 10uF 16V	0185-0007
C24	C: FIXED CERAMIC CHIP 0.1uF 50V C1206	0151-0014
C25	C: FIXED TANT 10uF 16V	0185-0007
C26	C: FIXED CERAMIC CHIP 0.01uF 50V C1206	0151-0021
C27	C: FIXED CERAMIC 3.3uF 50V	0151-0011
C28,C29	C: FIXED CERAMIC CHIP 0.1uF 50V C1206	0151-0014
C30	C: FIXED MICA 100pF 5%	0140-1015
C31,C32	C: FIXED CERAMIC CHIP 0.1uF 50V C1206	0151-0014
C33	C: FIXED CERAMIC 1.0uF 50V	0151-0008
C34	C: FIXED MICA 100pF 5%	0140-1015
C35,C36	C: FIXED CERAMIC CHIP 0.1uF 50V C1206	0151-0014
C37	C: FIXED MICA 100pF 5%	0140-1015
C38	C: FIXED CERAMIC CHIP 0.0047uF 50V C1206	0151-0030
C39,C40	C: FIXED CERAMIC CHIP 0.01uF 50V C1210	0151-0031
C41	C: FIXED CERAMIC 1.0uF 50V	0151-0008
C42	C: FIXED TANT 10uF 16V	0185-0007
C43	C: FIXED CERAMIC CHIP 0.1uF 50V C1206	0151-0014
C44,C45	C: FIXED CERAMIC CHIP 0.01uF 50V C1206	0151-0021
C46	C: FIXED CERAMIC CHIP 0.1uF 50V C1206	0151-0014
C47 thru C50	C: FIXED CERAMIC CHIP 0.01uF 50V C1206	0151-0021
C51	C: FIXED TANT 6.8uF 25V	0185-0002
C52	C: FIXED CERAMIC CHIP 0.1uF 50V C1206	0151-0014
C53	C: FIXED TANT 6.8uF 25V	0185-0002
C54	C: FIXED CERAMIC CHIP 0.1uF 50V C1206	0151-0014
C55	C: FIXED CERAMIC 1.0uF 50V	0151-0008
C56	C: FIXED TANT 100uF 6.3V	0185-0010
C57	C: FIXED CERAMIC CHIP 0.01uF 50V C1206	0151-0021
C58	C: FIXED CERAMIC 1.0uF 50V	0151-0008
C59	C: FIXED TANT 100uF 6.3V	0185-0010
C60	C: FIXED CERAMIC CHIP 0.01uF 50V C1206	0151-0021
C61 thru C66	C: FIXED CERAMIC CHIP 0.1uF 50V C1206	0151-0014
C67	C: FIXED TANT 10uF 16V	0185-0007
C68	C: FIXED CERAMIC 3.3uF 50V	0151-0011
C69,C70	C: FIXED CERAMIC CHIP 0.1uF 50V C1206	0151-0014
C71	C: FIXED TANT 6.8uF 25V	0185-0002
C72,C73	C: FIXED CERAMIC CHIP 0.1uF 50V C1206	0151-0014
C74	C: FIXED TANT 6.8uF 25V	0185-0002
C75	C: FIXED POLY 1000pF 2.5% 160V	0130-1022
C76	C: FIXED POLY 2000pF 2.5% 160V	0130-2022
C77,C78	C: FIXED CERAMIC CHIP 0.1uF 50V C1206	0151-0014
C79	C: FIXED CERAMIC 3.3uF 50V	0151-0011
C80 thru C83	C: FIXED CERAMIC CHIP 0.1uF 50V C1206	0151-0014

A1 BOARD CSA-1 cont.

Reference Designation	Description		Part Number
C84	C: FIXED POLY 82pF 2.5% 160V		0130-8202
C85	C: FIXED POLY 270pF 2.5% 160V		0130-2712
C86	C: FIXED POLY 82pF 2.5% 160V		0130-8202
C87 thru C90	C: FIXED CERAMIC CHIP 0.1uF 50V	C1206	0151-0014
C91	C: FIXED CERAMIC 1.0uF 50V		0151-0008
C92,C93	C: FIXED CERAMIC CHIP 0.1uF 50V	C1206	0151-0014
C94	C: FIXED MICA 100pF 5%		0140-1015
C95 thru C97	C: FIXED CERAMIC CHIP 0.1uF 50V	C1206	0151-0014
C98,C99	C: FIXED MICA 100pF 5%		0140-1015
C100	C: FIXED TANT 10uF 16V		0185-0007
C101 thru C103	C: FIXED CERAMIC CHIP 0.1uF 50V	C1206	0151-0014
C104	C: FIXED TANT 10uF 16V		0185-0007
C105 thru C108	C: FIXED CERAMIC CHIP 0.1uF 50V	C1206	0151-0014
C109	C: FIXED TANT 10uF 16V		0185-0007
C110 thru C112	C: FIXED CERAMIC CHIP 0.1uF 50V	C1206	0151-0014
C113	C: FIXED TANT 10uF 16V		0185-0007
C114 thru C116	C: FIXED CERAMIC CHIP 0.1uF 50V	C1206	0151-0014
C117	C: FIXED TANT 10uF 16V		0185-0007
C118,C119	C: FIXED CERAMIC CHIP 0.1uF 50V	C1206	0151-0014
C120	C: FIXED TANT 10uF 16V		0185-0007
C121	C: FIXED CERAMIC CHIP 0.1uF 50V	C1206	0151-0014
C122	C: FIXED TANT 10uF 16V		0185-0007
C123 thru C126	C: FIXED CERAMIC CHIP 0.1uF 50V	C1206	0151-0014
C127	C: FIXED TANT 100uF 6.3V		0185-0010
C128,C129	C: FIXED CERAMIC CHIP 0.1uF 50V	C1206	0151-0014
C130	C: FIXED TANT 10uF 16V		0185-0007
C131,C132	C: FIXED CERAMIC CHIP 0.1uF 50V	C1206	0151-0014
C133	C: FIXED TANT 100uF 6.3V		0185-0010
C134 thru C136	C: FIXED CERAMIC CHIP 0.01uF 50V	C1206	0151-0021
C137	C: FIXED MICA 33pF 5%		0140-3305
C138	C: FIXED CERAMIC CHIP 0.01uF 50V	C1206	0151-0021
C139 thru C142	C: FIXED CERAMIC CHIP 0.1uF 50V	C1206	0151-0014
C143	C: FIXED FILM 0.01uF 10% 100V		0122-1031
C144	C: FIXED CERAMIC CHIP 0.01uF 50V	C1206	0151-0021
C145	C: FIXED TANT 6.8uF 25V		0185-0002
C146	C: FIXED CERAMIC CHIP 0.01uF 50V	C1206	0151-0021
C147	C: FIXED TANT 6.8uF 25V		0185-0002
C148	C: FIXED CERAMIC CHIP 0.01uF 50V	C1206	0151-0021
C149	C: FIXED TANT 6.8uF 25V		0185-0002
C150	C: FIXED CERAMIC CHIP 0.01uF 50V	C1206	0151-0021
C151,C152	C: FIXED MICA 24pF 5%		0140-2405
C153	C: FIXED CERAMIC CHIP 0.1uF 50V	C1206	0151-0014
C154	C: FIXED CERAMIC CHIP 0.01uF 50V	C1206	0151-0021
C155,C156	C: FIXED TANT 4.7uF 10V		0185-0001
C157,C158	C: FIXED TANT 10uF 16V		0185-0007
C159 thru C163	C: FIXED CERAMIC CHIP 0.01uF 50V	C1206	0151-0021
C164	C: FIXED CERAMIC 1.0uF 50V		0151-0008
C165	C: FIXED CERAMIC CHIP 0.1uF 50V	C1206	0151-0014
C166 thru C172	C: FIXED CERAMIC CHIP 0.01uF 50V	C1206	0151-0021
C173	C: FIXED CERAMIC 1.0uF 50V		0151-0008
C174	C: FIXED TANT 100uF 6.3V		0185-0010
C175	C: FIXED CERAMIC CHIP 0.01uF 50V	C1206	0151-0021
CR1 thru CR8	DIODE: HP5082-2810		1900-0032
CR9 thru CR12	DIODE: HP5082-2800		1900-0026
CR13 thru CR16	DIODE: 1N4006		1900-0016
CR17,CR18	DIODE: 1N4690		1900-0031
CR19	DIODE: 1N4446		1900-0002

A1 BOARD CSA-1 cont.

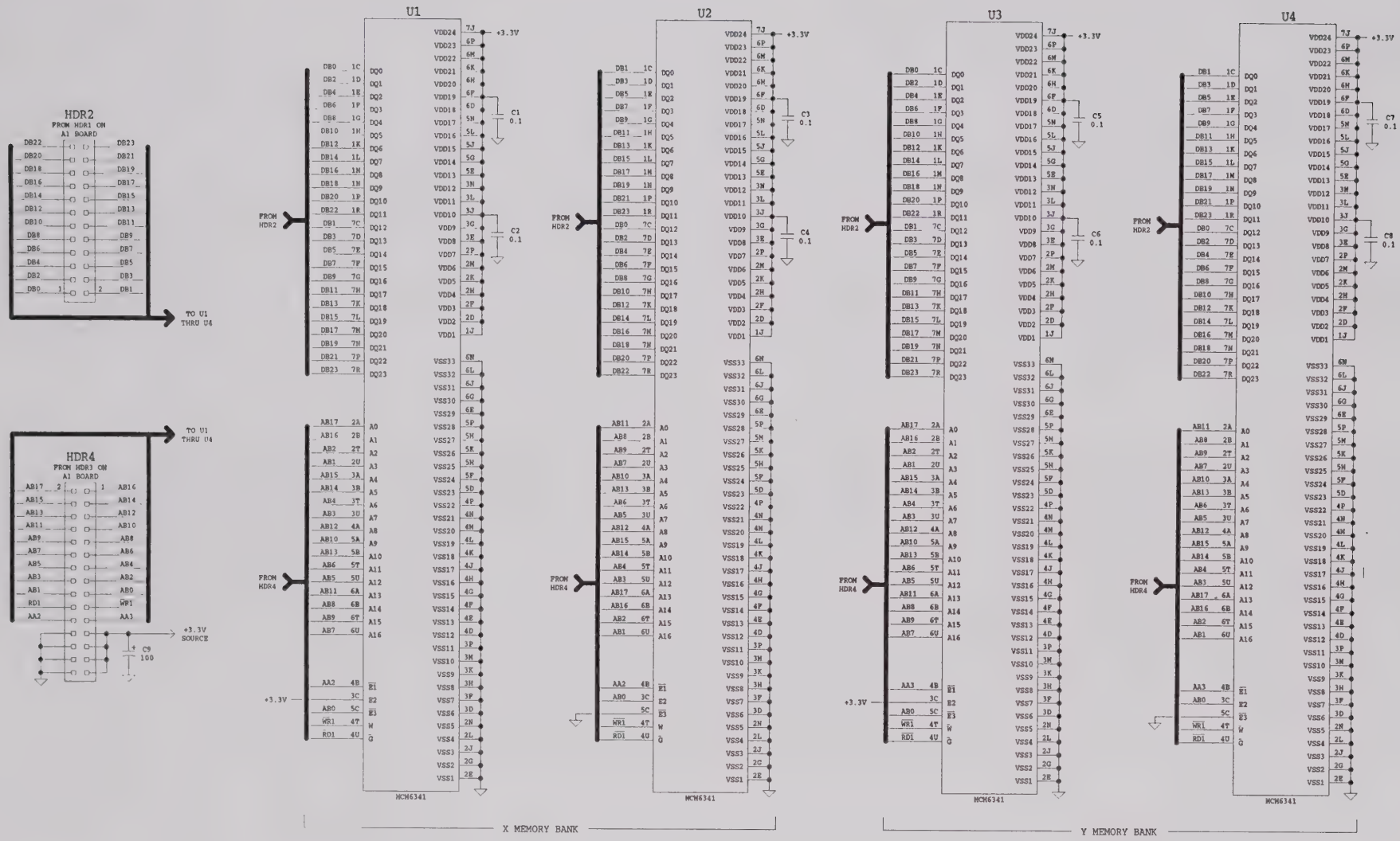
Reference Designation	Description	Part Number
CR20,CR21	DIODE: HP5082-2810	1900-0032
CR22	DIODE: HP5082-2800	1900-0026
CR23	LED: RED T-1	1910-0004
CR24	DIODE: 1N4006	1900-0016
HDR1	HEADER: 24 PIN	0361-0024
HDR3	HEADER: 30 PIN	0361-0030
HDR5	HEADER: 16 PIN	0361-0016
HDR7	HEADER: 26 PIN	0361-0026
J1	CONNECTOR: "D" SINGLE 9 PIN MALE	0360-0036
J3	CONNECTOR: "XLR" FEMALE	0360-0045
J4	CONNECTOR: BNC PC MOUNT	0360-0014
J5	CONNECTOR: "XLR" FEMALE	0360-0045
J6	CONNECTOR: BNC PC MOUNT	0360-0014
J7	CONNECTOR: "XLR" FEMALE	0360-0045
J8,J9	CONNECTOR: BNC PC MOUNT	0360-0014
L1,L2	CHOKE: 18uH	9141-0030
L3 thru L7	L: CHIP BEAD CORE EXC-CL3225U1	9145-0005
Q1	TRANSISTOR: 2N4401	1850-0028
Q2	TRANSISTOR: 2N2222	1850-0020
R1	R: METAL FILM 100k 1%	0721-1003
R2 thru R4	R: METAL FILM 10.0k 1%	0721-1002
R5	R: METAL FILM 499 1%	0721-4990
R6	R: VAR COMP 10k, 10 TURN	2100-0018
R7	R: METAL FILM 316 1%	0721-3160
R8	R: METAL FILM 1.10k 1%	0721-1101
R9	R: METAL FILM 10.0k 1%	0721-1002
R10,R11	R: METAL FILM 5.62k 1%	0721-5621
R12,R13	R: METAL FILM 100k 1%	0721-1003
R14	R: METAL FILM 5.62k 1%	0721-5621
R15	R: METAL FILM 5.76k 1%	0721-5761
R16	R: METAL FILM 49.9 1%	0721-49R9
R17	R: METAL FILM 243k 1%	0721-2433
R18	R: VAR COMP 100k, 10 TURN	2100-0030
R19	R: METAL FILM 243k 1%	0721-2433
R20	R: METAL FILM 5.62k 1%	0721-5621
R21	R: METAL FILM 5.49k 1%	0721-5491
R22	R: METAL FILM 49.9 1%	0721-49R9
R23,R24	R: METAL FILM 210 1%	0721-2100
R25	R: METAL FILM 100k 1%	0721-1003
R26 thru R28	R: METAL FILM 10.0k 1%	0721-1002
R29	R: METAL FILM 499 1%	0721-4990
R30	R: VAR COMP 10k, 10 TURN	2100-0018
R31	R: METAL FILM 316 1%	0721-3160
R32	R: METAL FILM 1.10k 1%	0721-1101
R33	R: METAL FILM 10.0k 1%	0721-1002
R34,R35	R: METAL FILM 5.62k 1%	0721-5621
R36,R37	R: METAL FILM 100k 1%	0721-1003
R38	R: METAL FILM 5.62k 1%	0721-5621
R39	R: METAL FILM 5.36k 1%	0721-5361
R40	R: METAL FILM 49.9 1%	0721-49R9
R41	R: METAL FILM 243k 1%	0721-2433
R42	R: VAR COMP 100k, 10 TURN	2100-0030
R43	R: METAL FILM 243k 1%	0721-2433

A1 BOARD CSA-1 cont.

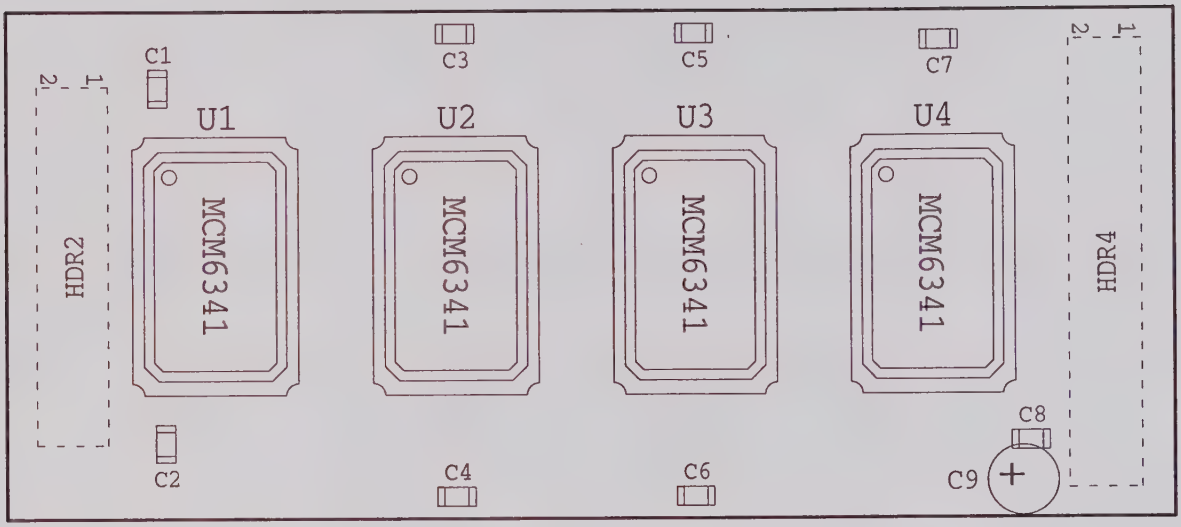
Reference Designation	Description	Part Number
R44	R: METAL FILM 5.62k 1%	0721-5621
R45	R: METAL FILM 5.90k 1%	0721-5901
R46	R: METAL FILM 49.9 1%	0721-49R9
R47,R48	R: METAL FILM 38.3 1%	0721-38R3
R49,R50	R: METAL FILM 16.5 1%	0721-16R5
R51,R52	R: METAL FILM 1k 2% 1/4W	0751-1022
R53	R: METAL FILM 750 2% 1/4W	0751-7512
R54	R: METAL FILM 75 2% 1/4W	0751-7502
R55,R56	R: METAL FILM 10k 2% 1/4W	0751-1032
R57	R: METAL FILM 100k 1%	0721-1003
R58	R: METAL FILM 1.00k 1%	0721-1001
R59	R: VAR COMP 2k, 10 TURN	2100-0032
R60	R: METAL FILM 316 1%	0721-3160
R61	R: METAL FILM 649 1%	0721-6490
R62	R: METAL FILM 1.00k 1%	0721-1001
R63	R: METAL FILM 100 1%	0721-1000
R64,R65	R: METAL FILM 316 1%	0721-3160
R66	R: METAL FILM 1.00k 1%	0721-1001
R67	R: METAL FILM 100k 1%	0721-1003
R68	R: METAL FILM 750 2% 1/4W	0751-7512
R69	R: VAR COMP 1k, 10 TURN	2100-0023
R70	R: METAL FILM 294 1%	0721-2940
R71	R: METAL FILM 100 1%	0721-1000
R72	R: METAL FILM 750 1%	0721-7500
R73	R: METAL FILM 100 1%	0721-1000
R74,R75	R: METAL FILM 280 1%	0721-2800
R76	R: METAL FILM 750 2% 1/4W	0751-7512
R77	R: METAL FILM 10k 2% 1/4W	0751-1032
R78,R79	R: METAL FILM 392 1%	0721-3920
R80	R: METAL FILM 3.32k 1%	0721-3321
R81	R: METAL FILM 100 1%	0721-1000
R82	R: METAL FILM 100k 1%	0721-1003
R83 thru R86	R: METAL FILM 392 1%	0721-3920
R87	R: METAL FILM 49.9 1%	0721-49R9
R88	R: METAL FILM 332 1%	0721-3320
R89	R: VAR COMP 100, 10 TURN	2100-0022
R90	R: METAL FILM 332 1%	0721-3320
R91,R92	R: METAL FILM 392 1%	0721-3920
R93 thru R95	R: METAL FILM 49.9 1%	0721-49R9
R96	R: METAL FILM 10k 2% 1/4W	0751-1032
R97	R: METAL FILM 2k 2% 1/4W	0751-2022
R98	R: VAR COMP 1k, 10 TURN	2100-0021
R99,R100	R: METAL FILM 1.00k 1%	0721-1001
R101	R: METAL FILM 49.9 1%	0721-49R9
R102	R: METAL FILM 1k 2% 1/4W	0751-1022
R103	R: METAL FILM 390 2% 1/4W	0751-3912
R104	R: METAL FILM 1k 2% 1/4W	0751-1022
R105,R106	R: METAL FILM 10k 2% 1/4W	0751-1032
R107	R: METAL FILM 294 1%	0721-2940
R108,R109	R: METAL FILM 10k 2% 1/4W	0751-1032
R110,R111	R: METAL FILM 4.7k 2% 1/4W	0751-4722
R112	R: FIXED CARBON 10M 5% 1/4W	0683-1065
R113	R: METAL FILM 4.7k 2% 1/4W	0751-4722
R114	R: METAL FILM 10k 2% 1/4W	0751-1032
RL1	RELAY: JWD-172-1	1600-0006
RN1	R: NETWORK 8 PIN 10k	0908-1032

A1 BOARD CSA-1 cont.

Reference Designation	Description	Part Number
T1	TRANSFORMER: PULSE 602-12545	9100-0030
U1	IC: OP-275	1826-0068
U2	IC: SSM2143P	1827-0006
U3	IC: OP-275	1826-0068
U4	IC: TLO71	1826-0004
U5	IC: OP-275	1826-0068
U6	IC: AD1879	1830-0010
U7	IC: 74HC125D	1872-0021
U8	IC: OP-275	1826-0068
U9	IC: SSM2143P	1827-0006
U10	IC: OP-275	1826-0068
U11	IC: TLO71	1826-0004
U12	IC: OP-275	1826-0068
U13	IC: AD811	1827-0014
U14	IC: AD1892	1880-0004
U15	IC: 74HC125D	1872-0021
U16	IC: XO, 24.576 MHz	0416-2457
U17	IC: 74HC125D	1872-0021
U18	IC: 74HC112D	1872-0004
U19	IC: 7905CT	1826-0056
U20	IC: 7805CT	1826-0014
U21	IC: MC33269T-3.3	1826-0065
U22	IC: AD844A	1826-0052
U23	IC: AD846A	1827-0008
U24	IC: AD844A	1826-0052
U25 thru U27	IC: AD811	1827-0014
U28	IC: OPA642	1826-0067
U29	IC: TLO71	1826-0004
U30,U31	IC: OPA642	1826-0067
U32	IC: DG419	1827-0011
U33	IC: AD817	1827-0015
U34	IC: AD780	1826-0064
U35	IC: AD817	1827-0015
U36	IC: AD9260	1880-0005
U37	IC: XO, 19.200 MHz	0416-1920
U38,U39	IC: 74HC574D	1872-0011
U40	IC: 74HC00D	1872-0001
U41	IC: 56303PV80	1890-0005
U42	IC: 74HC4050D	1872-0023
U43	IC: MC68HC11K1	1840-0017
U44	IC: MC34064	1826-0048
U45	IC: MAX232	1823-0001
U46	IC: 74HC157	1822-0081
U47	IC: 74HC00	1822-0039
U48	IC: CSA-1 EPROM	1840-0015A
U49	IC: MCM6206C	1840-0016
U50	IC: 74C923	1823-0006
U51,U52	IC: 74HC574A	1822-0053
U53	IC: CSA-1_DSP EPROM	1840-0015B
U54	IC: 74HC138	1822-0047
U55	IC: 74HC245A	1822-0078
U56	IC: 74HC573A	1822-0052
U57	IC: 74HC574A	1822-0053
Y1	XTAL: 16 MHz	0411-0008



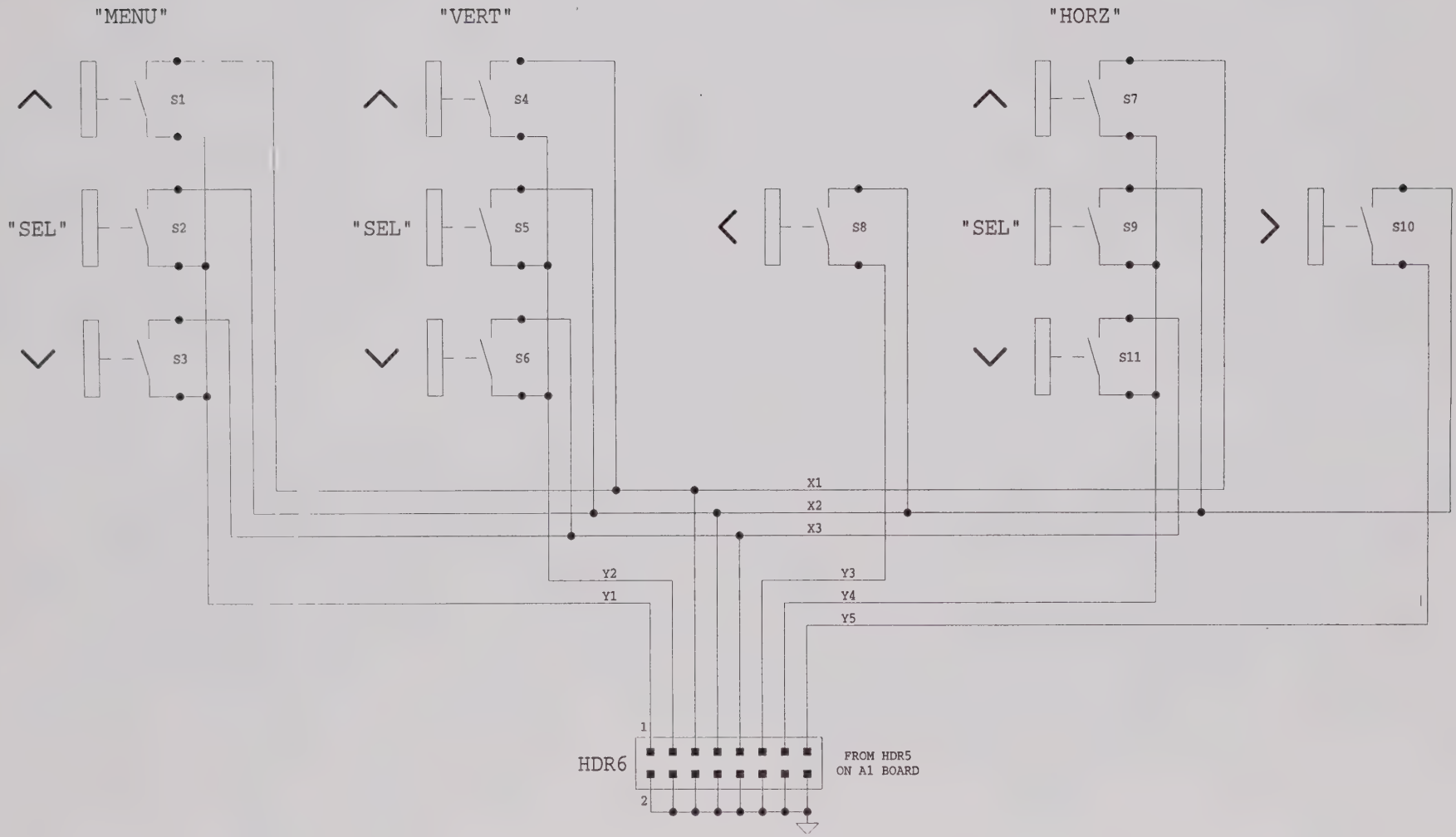
CSA-1
SPECTRUM ANALYZER
A1-1 MEMORY BOARD
BELAR ELECTRONICS
8-2-00



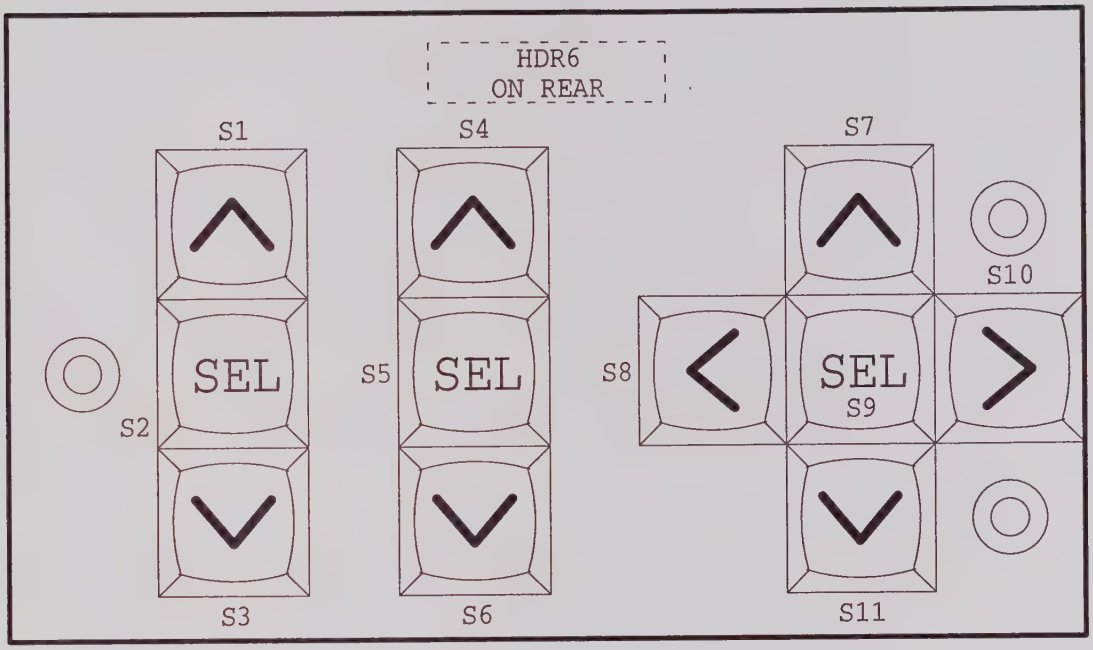
CSA-1 A1-1 BOARD
COMPONENT LAYOUT

A1-1 BOARD CSA-1

Reference Designation	Description		Part Number
C1 thru C8	C: FIXED CERAMIC CHIP 0.1uF 50V	C1206	0151-0014
C9	C: FIXED TANT 100uF 6.3V		0185-0010
HDR2	HEADER RECEPTACLE: 24 PIN		0361-2024
HDR4	HEADER RECEPTACLE: 30 PIN		0361-2030
U1 thru U4	IC: MCM6341ZP10		1890-0006



CSA-1
SPECTRUM ANALYZER
A2 BOARD
BELAR ELECTRONICS
8-2-00



CSA-1 A2 BOARD
COMPONENT LAYOUT

A2 BOARD CSA-1

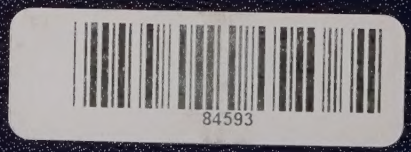
Reference Designation	Description	Part Number
HDR6	HEADER: 16 PIN	0361-0016
S1 thru S11	SWITCH: PUSHBUTTON, MOMENTARY	3105-0001

BELAR

ELECTRONICS LABORATORY, INC.

119 LANCASTER AVENUE
P.O. BOX 76
DEVON, PA 19333-0076 USA
VOICE (610) 687-5550 • FAX (610) 687-2686

http://www.belar.com
sales@belar.com
service@belar.com
parts@belar.com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